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51-01 Surfing Dental Sites on the World Wide Web

This issue's dental web site section features sites for various dental product manufacturers. Users at federal service clinics can often obtain a great deal of information about dental materials and equipment by accessing their manufacturers' web sites. Frequently, these sites provide users with an easy means of contacting the company to request Material Safety Data Sheets (MSDSs), catalogues, and current price information. Listed below is a partial list of some of the web sites maintained by dental product manufacturers. Sites are rated by DIS for content and usefulness of information, presentation, and user-friendliness.

Scale: ✯✯✯✯ - Excellent, ✯✯✯ - Good, ✯✯ - Average.

http://www.bosworth.com/ ✯✯✯
Harry J. Bosworth Company

Provides pictures of Bosworth products along with current ordering information. Products are arranged by categories such as asepsis, orthodontics, fixed prosthodontics, etc. A nicely done section also describes clinical techniques for using many of the products.

http://www.denmat.com/ ✯✯
Den-Mat Corporation

Site gives users basic information about Den-Mat's Cerinate Porcelain. A consumer information page for Rembrandt whitening products is also accessible.

http://www.midwestdental.com/index.html ✯✯
Midwest Dental Products

Features information about new Midwest products as well as its Midwest RDH Hygienist Handpiece and Midwest Plus handpiece cleaner and lubricant. Also informs users about Midwest's handpiece repair service.

http://www.espeusa.com/ ✯✯✯
ESPE America

Gives list of e-mail addresses for contacting individuals at the company. Information is provided for various ESPE America products such as Impregum, Permadyne, Ramitec, Dimension, Ketac-Cem, Durelon, Ketac-Fil, Ketac-Silver, Ketac-Bond, Pertac-Hybrid, Pentamix, Elipar II, Capmix, and Protemp. Also listed are Material Safety Data Sheets (MSDSs) for products and the dates and locations of upcoming dental trade shows.

http://www.ivoclarna.com/ ✯✯✯✯
Ivoclar North America

This well-organized, esthetically-pleasing web site features the latest news from Ivoclar, information about featured products, and opportunities for continuing education. You can also easily contact Ivoclar through the site and obtain more information about each of the Ivoclar products. Links for dental schools and professional organizations are also provided.

http://www.jeneric.com/ ✯✯
Jeneric/Pentron

Jeneric/Pentron's site offers information on a wide range of Jeneric/Pentron products such as impression materials, adhesive agents, amalgams, casting alloys, and porcelains. Also provides information on new products and updates on the proper use of existing products.

http://www.laresdental.com/ ✯✯
Lares Research

Product descriptions and pricing for the Lares line of high-speed and slow-speed handpieces.

http://www.moycotech.com/~moyco/ ✯✯
Moyco Technologies, Inc.

Information about Moyco Union Broach and a wholly-owned subsidiary, the Thompson Dental Manufacturing Company . Union Broach manufactures endodontic files and other related instruments, while Thompson manufactures and sells a wide variety of hand instruments. Their site describes some of the features that distinguish their hand instruments from those of other manufacturers.

http://www.septodont.com/ ✯✯
Septodont, Inc.

The web site of Septodont, Inc., which bills itself as the "world leader in dental anesthetics and accessories," lists several categories of information. Present or planned pages include the company's retail product catalog, pictures of its products, recent advertisements, links to dental dealers, technical infomation, frequently asked questions, and the Septodont article library.

http://www.snoreguard.com/ ✯✯
Snore Guard

This is the web site for the company that sells the Snore Guard, an oral appliance purported to prevent snoring. The site allows the user to access information about the Snore Guard and how it works. Additional information is available about snoring and sleep apnea.

http://www.kodak.com/aboutKodak/bu/hsd/dental/index.shtml ✯✯✯
Kodak Dental Products

This site offers information about Kodak's imaging products (e.g., intraoral film, extraoral film, darkroom accessories), Cooke-Waite Anesthetics, and Kodak's lead recycling program. Exposure guidelines are also given for Kodak radiographic film.

http://www.dentsply.de/ ✯✯✯✯
Dentsply

Product information about Dentsply products can be accessed using a list arranged by specialty area (i.e., endodontics, restorative, prosthetics, etc) or alphabetically. Detailed compositional and physical property information about select Dentsply products is also available through this site.

http://www.jmorita.com/cgis/regionpage.idc?region=northamerica ✯✯✯
J. Morita Company

An index of products is provided along with a search box enabling the user to search for a Morita product by name. Clicking the"Customer Support" button brings up a list of frequently asked questions about Morita products. Users can also take a "guided tour" of Morita to get a better understanding of the company and its philosophy.

http://www.sybor.com/jelenko/usa.html ☆☆☆☆
Jelenko

Provides information about the most recently introduced Jelenko products. Extensive information for each Jelenko alloy is also provided which includes compositional data, melting temperature range, casting temperature, coefficient of thermal expansion, and hardness. Jelenko's scrap assaying system is also discussed on the web site and an informative laboratory troubleshooting section is provided.

DIS ONLINE

Remember that you can access the DIS web site for current information and recent newsletters at:

http://www.brooks.af.mil/dis

51-02 Meeting the DIS Staff

In each issue of the ***D e n t a l I t e m s o f S i g n i f i c a n c e*** provide some brief biographical information about him or her. We hope that in providing a brief b i o g r a p h y o f t h e s t a f f , w e w i l l b e c o m e m o r e f a m i l i a r t o y o u s c discuss a matter, you will feel that you have a friend at the other end of the line. This issue's staff member is MSgt Neal Ryerson.

Neal grew up in New Jersey and enlisted into the Air Force after graduating

Warren AFB, where he began his career as a Dental Laboratory Technician. From 1982 to 1985, Neal honed his skills at Tyndall AFB. He arrived at

Dental Laboratory Technician Course and an Instructor for the Advanced Course. In 1988, Neal received a Bachelor's degree in Education from

Resident Technical Writer for the Dental Laboratory Career Development Course. This was followed by an overseas tour at Ramstein AB. Previous to

Randolph AFB where he was the NCOIC of the Dental Laboratory Flight. Wanting to continue his education, Neal completed a Master's degree in

NCOIC of Dental Laboratory Services. Neal, his wife Cheryl, and three sons Craig, Glen, and Alexander reside in San Antonio.

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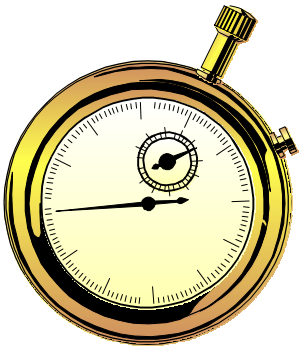
QUESTIONS & ANSWERS

"Questions & Answers" is a feature in which we present and answer the questions we most frequently receive from the field. This month we feature questions about amalgam mixing times, tomography, and respiratory hazards with dental porcelain. Should you want more information about a particular topic, please contact the individual whose name follows the specific answer in which you are interested. If you have a question about a topic not discussed in this issue, feel free to call DIS at DSN 240-3502.

51-03 Determination of Mixing Times for Amalgam



Question: I just received a new triturator that has a set mixing speed. Unfortunately, because the triturator is new, neither the manufacturer of the triturator nor the manufacturer of the amalgam I like to use provides a recommended mixing time for this triturator. Is there a way of determining how long I should mix the amalgam without simply guessing?

Answer: Your problem is not an uncommon one. Quite a few new triturators have been introduced to the market in the last five years. Not uncommonly, the manufacturer will neglect to include, or choose not to include, recommended mixing times for amalgam alloys. Usually, the clinician and assistant are left to their own devices to determine the appropriate mixing times. It is important to mix amalgam for the appropriate amount of time because it can affect the alloy's working time (i.e., the amount of time available for condensing and carving the amalgam), especially if the amalgam is an admixed type such as Dispersalloy® (Dentsply/Caulk), Valiant Ph.D.® (Ivoclar), or Original D® (Wykle Research). It is therefore important to have a method you can use to quickly and accurately determine the appropriate mixing time for your amalgam. One way of doing this is to follow the steps listed below:

Set the triturator's mixing time for 6 seconds shorter than you normally use.

1. Make a mix and examine the amalgam for plasticity.
2. If the amalgam is too dry and does not hold together, increase the mixing time by one-second increments, each time making a test mix and examining its plasticity.
3. When the first acceptable plastic mix is produced, increase the setting by two seconds and use that as the appropriate mixing time for that particular amalgam.

Further adjustments of the mixing time may be necessary, however this gives you one way of determining a mixing time using an organized approach.

(Lt Col Charlton)

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51-04 Tomography Issues

Question: We have a panoramic machine and would like to add tomographic capability. How feasible is this?

Answer: Many of the newer panoramic machines are now offering tomographic add-on kits for implant imaging at very attractive prices. Before purchasing one of these kits, it is important to talk with someone who has experience with it. Many buyers have been disappointed in the results obtained with these add on kits. Recent reports on the Oral Radiology e-mail listing from investigators in Sweden and San Francisco have described problems with the Planmeca PM 2002 CC tomography attachment. These include problems with aiming and unclear radiographs from too thick a slice thickness. These problems have also been found at Wilford Hall. Planmeca makes a panoramic machine designed for tomography called the Planmeca ProScan. Similar problems have not been found with this unit. If you are interested in doing tomography, consider your options carefully before buying equipment that might leave you disappointed. If you have questions, please contact Col Bill Moore at DSN 473-2343.

(Col Moore)

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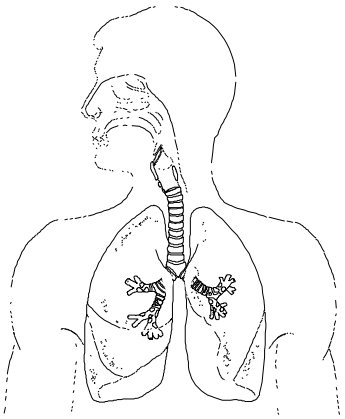
51-05 Respiratory Hazards with Dental Porcelain

Question: Our military public health people have been taking samples of our dental porcelain and individual air samples while technicians grind porcelain crowns. They stated that exposure to silica is now a Special Emphasis Program (SEP) for OSHA. Can you give me some more information on SEPs and silicosis.

Answer: OSHA currently has two SEPs in progress. One is preventing workplace violence and the other is preventing silicosis. A SEP is understood by inspectors as an alert to pay special attention to a subject during a site visit. It is possible that an OSHA, Air Force, or state inspector could investigate a laboratory to determine the hygiene practices and training program for workers exposed to silica. A site visit can be prompted by medical claims for silicosis, acute exposure to silica, or if an inspector notices silica listed as an ingredient on a material safety data sheets (MSDS).



Now for the second part of your question. Silicosis is a disabling and sometimes fatal respiratory disease caused by acute or chronic exposure to material containing crystalline silica (i.e., porcelain and abrasives). Inhalation of airborne crystalline dust has also been linked to tuberculosis and lung cancer. The best prevention is to use a properly operating dust collector. You should have a maintenance schedule for cleaning the dust collector and changing the filters. The bioenvironmental engineering section should also regularly check the dust collector. For more information, you can visit the OSHA website, http://www.osha.gov, OSHA Fact Sheet 96-54.

(MSgt Ryerson)

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WHAT'S NEW?

"WHAT'S NEW?" features recently-marketed dental equipment and materials. New and innovative products are marketed each month and DIS is unable to evaluate all of them. This section of the newsletter brings these products to your attention. Because DIS has not had the opportunity to evaluate these products, we cannot confirm manufacturers' claims about them. If you would like additional information about the products or are interested in evaluating them, please contact DIS.

Finesse Low Fusing Porcelain is a low-leucite ceramo-metal porcelain that fires at a temperature that is lower than that of most porcelain products currently on the market. The manufacturer, Ceramco, claims that Finesse fires at 770°C/1418°F and is less abrasive and kinder to the opposing dentition. Ceramco claims several other advantages for this product. First, its shades are matched to the Vita shade guide and it is said to have excellent translucency because it contains less leucite than other products. Finesse includes two shades of porcelain for bleached teeth. Also, Finesse is purported to maintain the same hue for all layers and to have higher value for its opaques and higher chroma for its dentin and modifier shades. An important advantage claimed for Finesse is that it can be shaped with a brush without slumping because its fine particle size holds moisture well. Final esthetics are also said to be enhanced because the material fires to a softer, more dense mass that polishes well. Due to its lower firing temperature, it may save time and money by reducing the need for post-soldering and lessen rounding of margins. Data supplied by Ceramco indicates that Finesse is as strong as ceramics that fuse at a higher temperature. The company claims Finesse bonds to all popular ceramic alloys, including Olympia. Although it is low fusing, it can only be used on ceramic alloys. Finesse is compatible with most high-fusing alloys (i.e. Olympia), but if used on alloys that contain silver, it may discolor. This issue is currently being addressed by Ceramco. The company recommends against combining Finesse with components of higher-fusing ceramics. A demonstration video and scientific manual are available. Eight component kits make up the system. They are powder opaque, paste

opaque, opaceous dentin, dentin, dentin modifier, enamel & mamelon, margin porcelain, and stain & glaze. The kits range in price from $314.00 to $652.50 (retail). Finesse can be purchased from Ceramco (800) 487-0100.

(MSgt Ryerson)

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Sable™ Seek® is a green-colored dye that can be used during caries excavation to identify the presence and location of carious dentin. Ultradent Products, Inc. currently sells a red-colored caries indicator called Seek®, but it is a glycol-based solution. Ultradent claims that because Sable™ Seek® is an aqueous solution, it is easier to remove from non-carious tooth structure by rinsing. Sable™ Seek® is purported to be useful when locating caries in difficult-to-see areas. Ultradent also mentions in the product instructions that Sable™ Seek® helps clinicians avoid over-excavating caries. The product is packaged in four 1.2-cc syringes and comes with 20 white Mini® Brush tips for directly dispensing the solution. A kit of Sable™ Seek® (REF/UP 233) is available from Ultradent (800) 793-5216 for $26.00 (retail) and $22.10 (government).

(Lt Col Charlton)

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Photac-Fil Aplicap Quick is a resin-modified glass-ionomer restorative material sold by ESPE America (Norristown, PA). The product is dual setting (light- and self-setting) and is recommended by the manufacturer for temporary restorations, pit and fissure sealing, and as a permanent material for the restoration of the class III and V lesions, V-shaped erosions, and small class I lesions. This product is intended to replace Photac-Fil Aplicap which was evaluated by DIS in the fall of 1993 and found to be unacceptable. Its unacceptability was based on the fact that laboratory testing found it bonded only weakly to dentin and lacked radiopacity. ESPE claims that it has addressed both problems with the new Photac-Fil Quick. Photac-Fil Quick is packaged in the familiar ESPE capsules that are activated and then mixed in an triturator immediately prior to use. A box of 50 capsules, applier, and activator can be purchased from ESPE America (800) 782-1571 for $201.50 (retail) and $120.88 (government).

(Lt Col Charlton)

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Hytac® Aplitip® is a light-activated compomer restorative material marketed by the ESPE America Company. ESPE claims that the product features the esthetics of a composite resin and the proven fluoride release of a glass ionomer. It is recommended for the restoration of class III, V, and selected class I and II restorations. It is also indicated for primary tooth restorations and cervical erosions/abrasions. The material is provided in single-use Aplitips® which are said to enhance infection control procedures. The tips are long, slender, and have a curved end to provide an unimpeded view of the preparation. To extend shelf life, the Aplitips® are provided in individual foil pouches. A special autoclavable, syringe-like applicator is provided for expressing Hytac from the tips. Immediately prior to placing the material in the preparation, the tooth surface is treated with a single-bottle bonding agent, Hytac OSB. The Introductory Pack contains a total of 36 tips. Although only 6 Vita shades are found in this kit, a total of 10 shades are available. A shade guide made of various thickness of Hytac is included in each kit. The Introductory Pack of Hytac® Aplitip® is available from ESPE America (800) 344-8235 for $90.00 (retail) and $68.25 (government).

(Lt Col Charlton)

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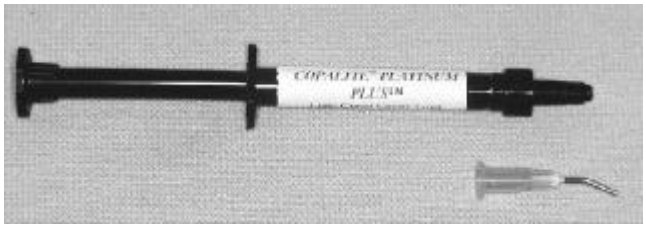
Copalite® Platinum Plus™ is a new, resin-based, light-cured cavity liner with fluoride sold by Cooley and Cooley, Ltd. The manufacturer claims that Platinum Plus™ has several advantages compared to two-part, self-cured products: it is stronger, more resistant to acid etchants, easier to apply, and less soluble. It is recommended for use under all types of restorations and is provided in a syringe with disposable tips. The product is not recommended for direct pulp caps but it can, in those cases, be placed over a calcium hydroxide liner. To use the product, the manufacturer recommends first removing the smear layer using Copalite® 10% Dentin Conditioner. A thin (0.5-mm) layer of the Platinum Plus™ is applied and light activated for 20 seconds. If desired, a second, thicker layer can then be applied and light activated. Copalite® Platinum Plus™ is available in two sizes: a 7.5-g and a 1.5-g syringe. The 1.5-g syringe can be purchased from Cooley and Cooley (281) 897-0009 for $10.51 (retail) and $9.46 (government).



(Lt Col Charlton)

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Core-Flo is a self-cured, flowable composite resin core build-up material. The manufacturer, Bisco, reports that it introduced this product to meet the need for a rapid-setting, flowable core material. Bisco claims the resin sets quickly (in approximately 2½ minutes) but provides a long enough working time so clinicians will be able to work with it without rushing. The manufacturer claims the product is adequately radiopaque for easy radiographic detection and is filled to 70% by weight with barium and strontium glass particles. It is provided as a two paste system in small (28-g) jars and is white, to make it easier to see during and after placement. In addition to being a core build-up material, Bisco recommends it for pre-fabricated post cementation and crown and bridge relining. Bisco claims that Core-Flo's physical properties, such as a low coefficient of thermal expansion and high compressive strength, make it a durable build-up resin. Core-Flo is available from Bisco (800) 247-3368 for $140.00 (retail) and ($119.00) government.

(Lt Col Charlton)

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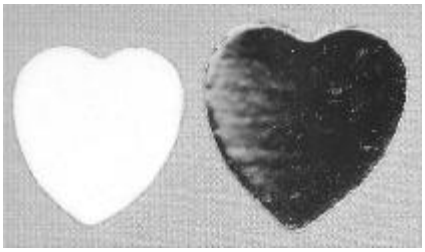
Richmond Reflective Shields™ are heart-shaped, moisture-absorbing pads for intraoral use. The pads are similar to others on the market in that they have a cloth-like absorbent surface that is placed against Stenson's duct to absorb saliva. The innovative aspect of this product is that the side toward the oral cavity is coated with a mirror-like, silver, light-reflective surface. The manufacturer, Richmond Dental, claims that this surface improves intraoral visibility by reflecting light on adjacent structures. The Shields come in a large and a small size. They are packaged 50 to a box and can also be ordered in a dual pack that contains 25 of each size. The Dual Pack version can be purchased from Richmond (800) 277-0377 for $9.00 (retail and government).



(Lt Col Charlton)

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Insta-Brite™ is a new tooth whitening system which uses an innovative tray/model system that the manufacturer, Bisco, claims significantly reduces time and cost. The carbamide peroxide bleaching agent comes in 10%, 20%, 30%, and 40% concentrations. This range is said to enable the dentist to provide the patient with the most effective gel without causing sensitivity. The 10%, 20%, and 30% concentrations are for at-home use, while the 30% and 40% can be used for a rapid-start, office treatment. A patient take-home kit contains three 0.5-oz squeeze bottles of the bleaching agent and two foam-lined, 0.20-inch plastic trays. Bisco claims that the foam-lined trays eliminate the time-consuming fabrication of trays with reservoir areas for the bleaching agent. To facilitate tray fabrication, the product

is provided with one automixed cartridge of a stiff silicone that is expressed into the patient's alginate impression. The silicone sets within 4½ minutes and the resulting silicone cast is used to make the patient tray. A Starter (3-bottle) Package of the 10% concentration of Insta-Brite™ is available from Bisco (800) 247-3368 for $57.00 (retail) and $48.45 (government). The Triple Package which contains three bottles each of 10%, 20%, and 30% concentrations costs $62.00 (retail) and $52.70 (government).

(Lt Col Charlton) **Return to index**

Composi-Tight™ is a matrix product specifically designed for posterior composite resin placement. The system consists of a sectional matrix band and a stainless spring steel ring (see figure at right). The matrix band sections come in three different sizes: small for bicuspids and primary molars, standard for most molars, and large which has an apical extension for deep cervical areas. The metal G-Ring is incompletely closed with two apical projections (tines) that have burnished, round ends. Two sizes of G-Rings are available: a standard length for class II restorations and an extended length that is used for multiple and class VI restorations. After the tooth is prepared, an appropriate-size sectional matrix is placed and wedged. The G-Ring is then placed over the band using rubber dam forceps (see figure at left). The manufacturer, GDS, claims that Composi-Tight makes it easier to produce a restoration with a broad contact area at the natural height of contour of the tooth. A complete Composi-Tight System Kit contains four standard G-Rings, three long-tine G-Rings, 50 standard bands, 50 small bands, 25 large bands, and instructions. The product is available from GDS (888) 437-0032 for $119.00 (retail and government).

(Lt Col Charlton) **Return to index**

Single Bond is a "one-bottle" bonding agent marketed by the 3M Company. It is similar to other "one-bottle" adhesives in that it is a combination of primer and adhesive in a single container. According to 3M, Single Bond contains dimethacrylates, HEMA, Bis-GMA, polyalkenoic acid copolymer, and photoinitiator in water and ethanol. It is recommended for direct composite bonding, bonding porcelain veneers, root surface desensitization, the bonding of composite to porcelain and various metals (e.g., set amalgam, base-metal alloys, and noble-metal alloys). Single Bond comes in an innovative bottle that features a hinged cap that is said to eliminate the possibility that users will drop or misplace the cap. The bottle is made of orange-tinted, translucent plastic that prevents exposure of the liquid to ambient light but allows the user to visually assess the amount of product that remains. Instructions call for the enamel and dentin to be simultaneously etched for 15 seconds, rinsed, and lightly dried with a mini-sponge or moist cotton pellet. The bonding agent is then applied in two consecutive coats, dried for 2 to 5 seconds, and light activated for 10 seconds. A box of Single Bond contains one 6-mL bottle of bonding agent, two 3-mL syringes of 35% phosphoric acid gel, and accessories. It is available from 3M (800) 237-1650 for $122.50 (retail) and $73.50 (government).

(Lt Col Charlton) **Return to index**

Syntac Single-Component Dental Adhesive is light-activated, one-component bonding agent for bonding composite resins and compomers to enamel and dentin. The manufacturer, Ivoclar North America (Amherst, NY), also recommends the product for some types of repairs (e.g., composite, amalgam, ceramic). Syntac Single Component is packaged in a 5-gm bottle and is provided with a 2-mL syringe of gel etchant. Ivoclar claims that the product is simple to apply, contains fluoride, and forms a thin film thickness. One of the distinguishing features of Syntac Single Component as described by Ivoclar is the fact that it is water based. This is purported to reduce evaporation from the bottle during use and obviates the need to use the product on moist dentin. The introductory kit of Syntac Single Component Dental Adhesive is available from Ivoclar (800) 533-6825 for $99.00 (retail) and $30.00 (government).

(Lt Col Charlton)

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OptiBond Solo is light-activated, one-component bonding agent marketed by the Kerr Corporation (Orange, CA). Kerr recommends Solo for: direct bonding of amalgam and composite to tooth structure, bonding composite to metal and porcelain, and for composite repairs. According to Kerr, OptiBond Solo differs from OptiBond in that its filler content has been reduced by half and its chemical composition has been altered. Kerr claims that OptiBond Solo is fluoride-containing, requires only one coat, and bonds to wet and dry dentin. Solo is packaged in disposable, plastic, single-dose capsules. By packaging Solo this way, Kerr claims that it eliminates the need for mixing wells, provides new product with each use, and enhances infection control. Solo is also available in bottles. An OptiBond Solo Unidose Kit contains 100 Unidose packets, a syringe of gel etchant, 10 disposable syringe tips, and 50 disposable Kerr Applicator Tips. It is available from Kerr (800) 537-7123 for $163.34 (retail) and $85.50 (government).

(Lt Col Charlton)

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The **Sani-Tab Chain-Free Towel** from CROSSTEX Disposables has been developed to eliminate the need for clips and chains when donning a patient towel. Each towel has two small adhesive tabs. It is attached by simply applying light pressure at the tab area after positioning the towel on the patient. The adhesive tabs stick to the patients' clothing and are easily removed by lightly pulling them off. The manufacturer claims that this method of attachment enhances infection control by eliminating the towel chain. Two types of Sani-Tab Towels are available. Sani-Tab Econoback Towels, which consist of 2-ply paper and a poly-plastic undersurface, are provided in a case of 400 for $25.95 (retail and government). Sani-Tab Polyback Towels, which consist of 3-ply paper and a poly-plastic undersurface, also come in a case of 400 for $28.95 (retail and government). For first-time orders, the company is offering one free case for the first three cases purchased. Sani-Tab Chain-Free Towels are available from CROSSTEX Disposables (800) 743-3490.

(TSgt Springstead)

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Team® Single Dose Pit and Fissure Sealant is a light-activated sealant marketed by Centrix, Inc. (Shelton, CT). The product is packaged in a strip of eight "LolliPacks™." Each LolliPack™ roughly looks like a lollipop (see figure) and consists of a well with a pre-measured amount of the sealant and a plastic, disposable, Benda®Brush applicator. To use the product, the clinician peels a foil cover away from the container which exposes the BendaBrush and a well of the white-colored sealant. The BendaBrush is then used to apply the sealant. No acid etchant is supplied with the sealant. A box of 32 single-dose LolliPacks™ with instructions and a Material Safety Data Sheet (MSDS) is available from Centrix (800) 235-

5862 for $45.95 (retail) and $39.05 (government).

(Lt Col Charlton)

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Team® Etch is a 40% phosphoric acid etchant marketed by Centrix, Inc. (Shelton, CT). Like the Team® Pit and Fissure Sealant, Team® Etch is packaged in a strip of eight "LolliPacks™." The light-blue gel etchant is contained in a well and is provided with a Benda®Brush. A box of 32 single-dose LolliPacks™ with instructions and a Material Safety Data Sheet (MSDS) is available from Centrix (800) 235-5862 for $17.60 (retail) and $14.95 (government).

(Lt Col Charlton)

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Brite 'N Clean is a slightly acidic, citric-based liquid compound that is purported to remove scale and mineral buildup associated with steam sterilizers. The compound is diluted (1:8) with water to form the cleaning solution and then placed into the reservoir for use with the sterilizer's cleaning cycle. The manufacturer claims that Brite 'N Clean should be used for routine cleaning cycles. It is recommended by the manufacturer for all steam sterilizers except for the Stat *IM*, marketed by SciCan USA. Sterling Techniques, Inc. has yet to test the product in the Stat *IM* and therefore does not recommend its use. In addition to descaling steam sterilizers, it is also purported to remove stains from dental instruments. Brite 'N Clean comes in a 16-ounce bottle and is available in a case of 12 for $90.00 (retail) and $49.20 (government) from Sterling Techniques, Inc. (704) 896-7953.

(SSgt Martin)

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The **Ergoject** is a new syringe available from Anthogyr which is specifically designed to facilitate intraligmental and intraseptal injections that require high pressure. Designed and manufactured in France, it features an ergonomic handle constructed of thermoplastic resin and stainless steel. Anthogyr claims that the Ergoject has a leverage factor of three to make it easier to use and an anti-reverse, non-ratcheting mechanism that prevents the plunger from slipping during injection. The stainless steel syringe barrel locks to the handle via a bayonet mounting system. A protective transparent sleeve slips over the barrel to protect patients and providers from broken carpules. The syringe is sterilizible, with the exception of the transparent sleeve. The Ergoject Syringe accepts standard dental carpules and is available from Anthogyr (France) (33) 04.50.58.02.37 for $193.00. This price is approximate and was based on the April 1997 currency exchange rate.

(SSgt Martin)

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Another new product from Anthogyr is the **Clip Securit** needle attachment system. The Clip Securit is a plastic sleeve that provides an attachment point at the end of the syringe barrel and enables the user to safely eject needles directly into the sharps container using a one-handed technique. The sleeve is retained by a modified syringe barrel with bayonet mounts. Because of the design of the syringe barrel, it is currently only compatible with the Ergoject and Anthogyr's line of aspirating syringes. However, it is purported by the manufacturer to be compatible with all brands of needles. The Clip Securit is available in a Test Kit of 40 clips and modified syringe barrel for $42.50 or in a box of 100 clips for $10.80 from Anthogyr (France) (33) 04.50.58.02.37. These prices are approximate and were based upon the April 1997 currency exchange rate.

(SSgt Martin)

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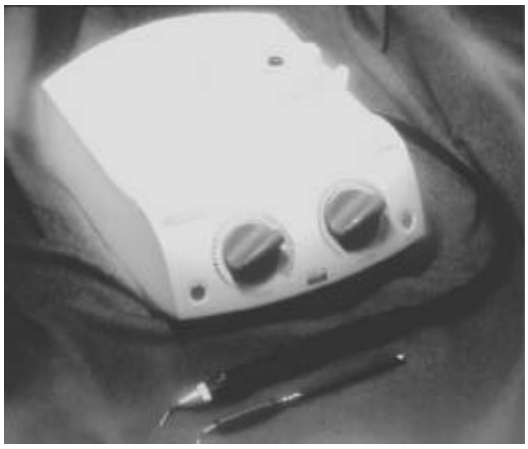
The **Cavitron® SPS™ Scaler and Cavitron™ Jet** are scheduled to be introduced by Dentsply/Cavitron. The scaler features Cavitron's new Sustained Performance System™ technology which is reported to help the scaler maintain effectiveness despite varying scaling demands that might be encountered clinically. While maintaining effectiveness, it uses the lowest possible power settings, thus increasing patient comfort. The foot control has a second position that provides a momentary power boost override to remove isolated tenacious heavy calculus. The Cavitron™ Jet combines both SPS™ scaling and air polishing in one unit. The Cavitron® SPS™ Scaler is projected to be priced at $1495.00 (retail), $971.50 (government). The Cavitron™ Jet's projected price is $3425.00 (retail) and $2226.25 (government). For more information call (800) 877-0020, ext. 471.



(Lt Col Leonard)

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Pelton & Crane recently introduced the **Spirit S1 Dental Delivery System.** All functions of the chair/unit/light can be controlled by either the "foot mouse" or the control unit's membrane touchpad. The unit can support both air turbine as well as electric handpieces and is available with a built-in Demetron curing light and Piezon scaler. In addition, a Sprayvit three-way syringe with fiberoptics and heat is available. An automatic and continuous hydrogen peroxide-based disinfection system is purported to control biofilm formation and provide water with less than 100 colony forming units (CFU) per milliliter (mL). An air-gap mixing tank prevents the backflow of system water into source water lines and an optional centrifuge amalgam separator reduces the amount of amalgam waste discharged into the municipal sewer. The system as described is available from Pelton & Crane (800) 659-6576 for $23,100 (retail) and $11,781 (government). Deletion of the optional Demetron curing light, Piezon scaler, amalgam separator, and Sprayvit three-way syringe reduces the price to $17,885 (retail) and $9,121 (government).

(Lt Col Leonard)

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Tetric® Flow is a light-activated composite resin restorative material marketed by the Vivadent Company. Tetric® Flow is one of the many new "flowable" composite resins that have entered the market. It is recommended by Vivadent for 11 different purposes including: cervical, anterior, and small posterior restorations; preventive resin restorations; blockout of undercuts; splinting of mobile teeth; and for repairing composite and porcelain veneers. Vivadent claims that Tetric® Flow has excellent wetting and flow properties, releases fluoride, and is radiopaque and polishable. It is supplied in single-dose Cavifils which have a slender, narrow dispensing tip to facilitate

placement. The Cavifils are color-coded according to shade. The Assortment Package version of Tetric® Flow contains a total of 40 Cavifils, five each of shades A1, A2, A3, A3.5, B3, A4, transparent, and 105 (which has no Vita equivalent). A shade guide is also provided. The product is available from Vivadent (800) 533-6825 for $119.00 (retail) and $65.45 (government).

(Lt Col Charlton) **Return to index**

Tetric® Ceram™ is a light-activated composite resin marketed by the Vivadent Company for use in restoring anterior and posterior teeth. Vivadent claims that Tetric® Ceram™ has several features not exhibited by other composite resins. First, it is said to provide clinicians with extended working time because its photactivation system is not as sensitive to ambient light as those used in other products. Second, Tetric® Ceram™ is said to possess excellent stability of shape combined with ease of handling. The product can be shaped easily because it is not tacky and retains its shape after placement. The resin is also said to be highly polishable, fluoride releasing, and extremely radiopaque. The Cartridges System Set contains forty 0.25-g cartridges in eight assorted shades, phosphoric acid etchant, Syntac Single-Component Bonding Agent, shade guide, and accessories. A total of 15 shades are available (11 enamel, 3 dentin, 1 translucent). Tetric® Ceram™ can be purchased from Vivadent (800) 533-6825 for $195.00 (retail) and $107.25 (government).

(Lt Col Charlton) **Return to index**

ESPE America recently introduced the **Elipar® Highlight curing light**. The light is unique in that it has the capibility to utilize a two-level irradiance polymerization. Recent research indicates that two-step curing reduces marginal gap generation without adversely affecting the composite's physical properties. The Elipar® Highlight first delivers 150mW/cm^2 for 10 seconds and then delivers either 30 or 50 seconds of full, 700 mW/cm^2 irradiance. In addition, the light can deliver a standard full 700mw/cm^2 irradiance throughout the polymerization. The light is generated by a 75-watt quartz-halogen bulb and the internal filter restricts light to the spectral range of 400 to 500 nm. The unit has a built-in light meter for periodic confirmation of the unit's irradiance output. It comes standard with an autoclavable 10-mm diameter curing rod with the availability of 3-mm and 13-mm curing rods. The Elipar® Highlight is available from ESPE America (800) 344-8235 for $699.00 (retail) and $524.25 (government).

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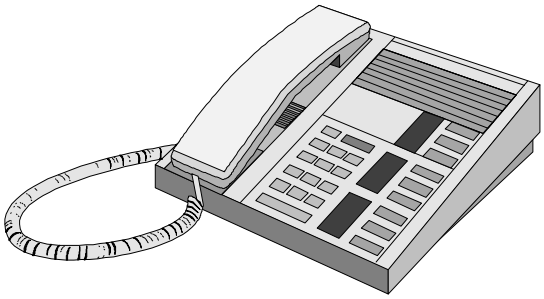
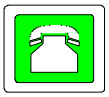
ACTION LINE!



ACTION LINE! is used by the DIS staff to help federal service dentists with practical problems they've encountered when buying or using dental materials or equipment. Had an impression material that didn't set or need a replacement wand for a light unit and you can't find a source? Or are you having difficulty getting a manufacturer to respond to your request for information or assistance? If so, give MSgt Jim Foster a call at DSN 240-3505/3502 or comm (210) 536-3505/3502 and tell him you're calling the **ACTION LINE!** for help.



"Mirrors are being damaged in our Miele Thermal Disinfector. Is there a reason for this?"

A number of facilities have indicated that they have been having excessive mirror damage when using the Miele Thermal Disinfector to clean mirrors prior to sterilization. Some of the damage - scratching of the surface - appears to result from mirrors bouncing around in a basket during the wash cycle. This should be preventable by placing mirrors in cassettes that hold them securely, not allowing them to bounce around.

The other problem is related to the quality of the mirror surface and the type of detergent being used. The reflective coating on inexpensive mirrors appears to rapidly degrade, making the mirrors totally useless, when subjected to the Miele Neodisher Alkaline Detergent. Miele claims that higher quality, rhodium-plated mirrors are not effected by the alkaline detergent.

If you are unable to purchase the more expensive mirrors, another option is to stop using the alkaline detergent. In a project he completed here at DIS in 1995, Lt Col Leonard demonstrated that other detergents, such as MDT NeutraWash, are just as effective and may cost less (DIS 47-039). Be aware that MDT NeutraWash is a neutral pH detergent that does not require neutralization. The Miele Neodisher Alkaline Detergent has a high pH and must be neutralized by the Miele Neodisher Acid Rinse; they are meant to be used together. Some facilities mistakenly substituted the MDT NeutraWash for the Miele Neodisher Acid Rinse while continuing to use the alkaline detergent, thinking that the MDT NeutraWash would neutralize the alkaline detergent. As a result, the instruments were subjected to two detergents and left in a high alkaline environment, which resulted in further damage. To summarize, MDT NeutraWash is a neutral pH detergent. It is not used to neutralize the Miele Neodisher Alkaline Detergent. You must use the Miele Neodisher Acid Rinse to neutralize the Miele Neodisher Alkaline Detergent. Using the MDT neutral pH detergent may prevent excessive mirror damage.

(MSgt Foster, Col Plamondon)

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FROM THE LITERATURE

Periodically, articles appear in the literature that present clinically useful information or evaluate the performance of a material or piece of equipment. Because DIS believes that this type of research is of value to clinicians, we present a brief description of these articles to make you aware of them. The complete citation is provided so you can obtain the article if you are interested in reading it in its entirety.

CURRENT INFORMATION ABOUT CASTING ALLOYS AND BIOCOMPATIBILITY

CLINICALLY RELEVANT

Leinfelder, KF. An evaluation of casting alloys used for restorative procedures. J Am Dent Assoc 1997;128:37-45.

Precision-type castings have been used in dentistry since 1907 when Taggert introduced the lost-wax technique. Gold-based alloys have been used very successfully for fabricating restorations, however their relatively high cost led to a concerted effort to find less expensive alloys. Although lower-cost base-metal alloys have been used for many years in dentistry, they posses certain physical property limitations and are not as biocompatible as the gold alloys. The purpose of this article was to discuss the most recent findings about alloy systems and possible tissue responses to them. Base-metal alloys, introduced about 20 years ago in dentistry, have become quite popular for producing cast restorations. These alloys have some properties that are better than those of the gold alloys. One in particular, modulus of elasticity (rigidity), makes base-metal alloys appropriate for fixed and removable restorations. Because they are stiff, fixed partial dentures and single-units can be cast in thinner sections which provides more room for porcelain application. These castings also flex less than gold alloys, thereby reducing the possibility of catastrophic failure of the overlying porcelain. Unfortunately, the base-metal alloys require casting procedures that are different from those used with gold alloys. Also, joining individual units is quite difficult. A major potential problem with base-metal alloys is their biocompatibility. Many of these alloys contain nickel which can cause allergic reactions in patients and beryllium which can have adverse respiratory effects in laboratory technicians. Recent studies have found that beryllium-containing nickel-chromium alloys release corrosion products that decrease in vitro cellular proliferation. Beryllium also decreases corrosion resistance, which in turn may interfere with cellular energy metabolism. The article also presents an interesting discussion of copper-aluminum alloys which have been used extensively in Brazil as substitutes for common dental casting alloys. These alloys can be cast using the same procedures as those used with gold alloys, but they must be invested with phosphate-bonded investments. Studies have found that they are similar to the gold alloys in their castability, fit, and burnishability. Intraorally, castings made of copper-aluminum alloys appear to corrode very little, however, in the laboratory they corrode more than gold-based alloys. Intraoral findings of less corrosion appear to be due to the ease with which corrosion by-products are removed by toothbrushing or tongue movement. The article ends with a discussion of low-gold alloys and the clinical studies that have been done to evaluate them.

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POSTERIOR COMPOSITE PLACEMENT: A SYRINGE TECHNIQUE IS BEST

PRODUCT EVALUATION

Opdam NJM, Roeters JJM, Peters TCRB, Burgersdijk RCW, Teunis M. Cavity wall adaptation and voids in adhesive Class I resin composite restorations. Dent Mater (1996)12:230-235.

Posterior composite restorations are much more technique sensitive than their amalgam counterpart and therefore demand increased attention to detail during their placement. One area of concern during composite placement is the avoidance of void formation. The authors note multiple problems with void incorporation into posterior composites, including lowered fatigue resistance and flexural strength, increased wear and propensity for microleakage if the voids occur at the margin, and

potential for radiographic misinterpretation as secondary caries. This study was undertaken to determine what effect the composite placement technique and composite consistency had on void formation. 100 standardized Class I adhesive preparations were made in human third molars. The preparations were conditioned, bonding agent placed (Clearfil PhotoBond, Kuraray) and light cured. The teeth were restored in two oblique increments with one of three composites: thick consistency Herculite XRV (Kerr), medium consistency Clearfil Ray Posterior (Kuraray) and thin consistency P-50 (3M). Each composite was placed using each of three placement techniques: *injection technique*: the composite was loaded into a Centrix tip (Hawe Neos) and syringed into the cavity preparation. An additional group was done with Herculite XRV, but the composite was syringed into the preparation with the Kerr Unidose tip; *smearing technique*: the composite was placed into the cavity with a hand instrument by wiping the material along the cavity wall and molding it into position; *condensation technique*: the composite was placed into the preparation and then condensed into position. Each increment was light cured from two directions for 30 seconds each. The various combinations of insertion technique and composite consistency resulted in 10 different groups. Following finishing with a fine diamond and storage for 24 hours in tap water, each restoration was sectioned bucco-lingually into four separate sections, immersed in dye, and observed under 4x magnification for voids. **The results clearly showed that the injection technique with the Centrix tip worked best for all composites, and condensation produced the most voids.** The thick consistency composite resulted in more voids than the medium or thin consistency materials, possibly due to the thicker material's inability to adapt to the cavity walls. Injection with the Unidose tip resulted in more voids than the Centrix tip, which the authors attributed to the greater tip diameter of the Unidose tip and resulting decreased access to all aspects of the preparation.

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GLASS IONOMER LINERS AND BASES: ARE THEY SUFFICIENTLY RADIOPAQUE?

Shah PMM, Sidhu SK, Chong BS, Pitt Ford TR. Radiopacity of resin-modified glass ionomer liners and bases. J Prosthet Dent 1997;77:239-242.

Dental materials need to be radiopaque so that clinicians can distinguish them from tooth structure. Unfortunately, no standard specifies the degree of radiopacity necessary for resin-modified glass-ionomer materials. This study measured the degree of radiopacity of resin-modified glass ionomers used as liners/bases and compared it to that of conventional liner/base materials. The radiopacity of seven products used as liners/bases was measured: two zinc oxide-eugenols (Kalzinol, IRM), a zinc phosphate cement (SS White), three resin-modified glass ionomers (Vitrebond, Fuji Lining LC, Photac Bond), and a conventional glass ionomer (Ketac-Bond). Disc-shaped specimens (10 mm in diameter by 1 mm thick) were made of the materials using a stainless-steel mold and radiographs were made of the specimens using a standard intraoral x-ray unit. Radiographs of an aluminum stepwedge and a 1-mm thick section of dentin were also made. After the films were developed, a photographic densitometer was used to measure the readings of the radiographic images (including each step of the aluminum stepwedge). The radiographic density values were transformed into radiopacity expressed as an equivalent thickness of aluminum. Results indicated that the radiopacity of the materials varied significantly ($p<0.05$). The three most radiopaque materials were the two zinc oxide-eugenol products and the zinc phosphate cement. The conventional glass ionomer (Ketac-Bond) was more radiopaque than the three resin-modified glass ionomers (Vitrebond, Fuji Lining LC, Photac Bond). **The most clinically-relevant finding in this study was that all the liner/base materials had sufficient radiopacity to be detected radiographically and be distinguished from dentin.**

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AMALGAM BONDING: ADHESIVE INCORPORATION?

Adhesive liner incorporation in dental amalgam restorations. Boston DW. Quintessence Int 1997;28:49-55.

Amalgam bonding has become a popular clinical procedure in the United States. Clinicians are lining preparations with dentin bonding agents immediately prior to placing amalgam in the belief that it will strengthen remaining tooth structure, reduce leakage, reduce sensitivity, and increase retention of the restoration. Although laboratory and clinical studies continue to be done to

determine if these benefits are actually realized, one aspect of using dentin bonding agents with amalgam that has received relatively little attention has been the effect of the bonding products on the resulting restoration. In short, is the adhesive incorporated into the amalgam during condensation and if so, are the amalgam's physical properties compromised? Two previous studies suggested that properties such as compressive strength and tensile strength may be adversely affected by certain adhesive products. The purpose of the present study was to evaluate the distribution of adhesive resin liners within amalgam restorations. Standardized 4 mm by 6 mm rectangular preparations were made in extracted human molar teeth. In one group, the preparations were unlined and in the other groups, the preparations were lined with Amalgambond Plus (Parkell) or All-Bond 2/Resinomer (Bisco). Dispersalloy amalgam (Dentsply/Caulk) was condensed into the preparations and carved. After one week of storage, the restorations were sectioned into slices approximately 190 microns in thickness. Radiography and optical microscopy were used to examine each section to determine the presence and distribution of bonding agent within the amalgam. Results indicated that the two adhesives were incorporated into the restorations and appeared to be oriented in irregular sheets that were roughly parallel to the pulpal floor. Smaller, more broadly-dispersed inclusions were also seen. **The authors concluded that the two adhesives used in this study were incorporated into the restorations and may contribute to the decrease in amalgam's properties reported in earlier studies.**

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EFFECT OF DESENSITIZERS ON CROWN RETENTION

CLINICALLY RELEVANT

Swift EJ, Lloyd AH, Felton DA. The effect of resin desensitizing agents on crown retention. J Am Dent Assoc 1997;128:195-200.

Tooth sensitivity following crown cementation is not an uncommon occurrence. Because the sealing of dentin using resin-based desensitizers has been shown to reduce sensitivity, this study was conducted to evaluate the effect of such desensitizers on the retention of crowns luted with different types of permanent cements. Extracted human molar teeth were mounted in resin and a handpiece apparatus was used to prepare standardized full crown preparations. Full crown patterns were made in wax with a loop on the occlusal surface to serve as a connection point to the testing machine. The patterns were cast and readied (dried and air abraded with aluminum oxide) for cementation. Three luting cements were studied: a zinc phosphate (Hy-Bond, Shofu), a traditional glass ionomer (Fuji I, GC America), and a resin-modified glass ionomer (Vitremer Luting Cement, 3M). For each cement, the teeth were divided into three groups. Group 1 teeth were untreated prior to cementation (control group). Group 2 teeth were treated with Gluma Desensitizer (Heraeus Kulzer). Group 3 teeth were treated with One-Step (Bisco), a bonding agent that can also be used as a desensitizer. After tooth surface treatment, the crowns were cemented with the luting agent and were then stored for 24 hours in room- temperature tap water. At 24 hours, a testing machine was used to measure the amount of force required to remove the crowns. Results indicated that for each cement, there was no significant difference in the amount of force required to remove the crowns from the control, Gluma-treated, and One-Step-treated teeth. Overall, the glass-ionomer cements provided significantly greater retention than the zinc phosphate cement. **The authors concluded that the desensitizers tested had no significant effect on retention provided by the zinc phosphate, glass-ionomer, and resin-modified glass-ionomer cements used in this study.**

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IS THERE A GREATER REDUCTION IN AMALGAM THERMAL SENSITIVITY USING ADHESIVE LINERS?

CLINICALLY RELEVANT

Browning WD, Johnson WW, Gregory PN . Postoperative pain following bonded amalgam restorations. Oper Dent (1997) 22:66-71.

The use of adhesive liners under amalgam restorations has been recommended by a number of dental publications and has become increasingly popular. One of the most common reasons cited for this procedure is the purported superior sealing of the cavity-restoration interface by the adhesive liner. The resultant decrease in microbial contamination and enhanced sealing of dentinal tubules would then decrease post-operative temperature sensitivity. The purpose of this clinical study was to determine if amalgam restorations placed in conjunction with an adhesive liner had less cold sensitivity following placement than amalgams placed using conventional cavity sealers and bases. Sixty adult patients were

assessed preoperatively to determine cold sensitivity on a tooth requiring either a Class I or Class II amalgam restoration. After caries removal, the preparation was placed into one of three categories based on lesion depth. Patients were randomly assigned to either the treatment group (adhesive liner) or control group (conventional sealers/bases). The treatment protocols are as follows:

Category	Lesion Depth	Treatment Group	Control Group
1	within one mm of ideal depth pulpally and axially	Optibond Adhesive System (Kerr)	Copal varnish
2	more than one mm past ideal depth axially and/or pulpally	Optibond Adhesive System	Zinc phosphate cement and copal varnish
3	within one mm of the pulp	Dycal on area nearest pulp, Optibond System	Dycal on area nearest pulp,zinc phosphate cement and copal varnish

All zinc phosphate bases were at least one mm thick, and all teeth were restored with Contour amalgam (Kerr). The patients were asked to self-assess post operative discomfort at 24 hours, four and seven days, and were seen one week post-operatively to determine cold response. There were no statistically significant differences between the groups at any time period. **The study demonstrated findings similar to other studies: many patients experience no post-operative temperature discomfort following amalgam restoration; of those that do, the vast majority consider their pain to be minimal; and use of an adhesive liner provides no benefit in reducing post-operative temperature sensitivity compared to conventional sealers and bases.**

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DIS IN PRINT

This feature of the newsletter appears periodically to highlight recent publications by the DIS staff. A brief description of the work follows the title. If you are interested in reading the entire article, please call the individual whose name is highlighted for a reprint.

Dentin bonding: Past and present. **Charlton, DG.** Gen Dent 1996;44:498-507.

Dentin bonding is one of the most dynamic areas in dental materials. The growing number of products and rapidly changing techniques for maximizing bond strength and durability have made it difficult for practitioners to stay abreast of the field. The purpose of this review article was to present a broad discussion of dentin bonding. It begins with a concise review of the mechanisms involved in bonding resins to enamel and dentin. A more detailed discussion of the sequential, generational development of dentin bonding products follows. The article also provides a review of additional uses for bonding agents such as amalgam bonding, dentin desensitization, and dentin treatment prior to luting restorations with resin cements. Finally, several factors are discussed that can help enhance clinical success when using bonding products.

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Microleakage of four Class II resin composite insertion techniques at intraoral temperature. **Hilton TJ**, Schwartz RS, Ferracane JL. Quintessence Int 1997;28:135-144.

Although resin composites have improved significantly over the years, one drawback that continues to plague the material is polymerization shrinkage. This volumetric contraction upon setting has been associated with a number of clinical problems, including post-operative sensitivity, recurrent

caries, marginal staining and pulpal pathoses. A variety of composite fill techniques have been advocated to reduce the adverse consequences of polymerization shrinkage. One such technique that has been recommended is the "directed shrinkage" technique, which combines placement of an autocure composite into the bulk of the cavity preparation with an occlusal veneer of visible light cure (VLC) composite. The purported benefit is that autocure composite will begin to polymerize at the cavity wall where it has been warmed by body temperature. In addition, it has been suggested that the composite polymerization at the cavity wall could be accelerated by the presence of an ongoing polymerization reaction of a previously placed dual cure adhesive. The purpose of this study was to evaluate how two incremental fill techniques with VLC composite and two directed shrinkage fill techniques accomplished at intraoral temperature affected microleakage. Extracted human molars had Class II slot cavities of standardized dimensions prepared on the mesial and distal surfaces with the gingival margin located below the CEJ. Each group of ten specimens utilized the All-Bond 2 dentin bonding agent(dba)/Bisfil composite system (Bisco Dental). Each specimen was warmed to 37^{o} C immediately prior to restoration placment. Group A used VLC dba and had VLC composite placed in three increments with a clear matrix and reflecting wedge: one thin horizontal increment at the gingival margin cured first through the reflecting wedge, followed by two vertical increments cured first through the clear band adjacent to the composite increment. Group B used VLC dba and had VLC composite placed in three horizontal increments with a metal matrix, all cured from the occlusal direction. Group C used dual cure dba followed by placement of autocure composite to fill the box to the level of the DEJ, followed by placement of VLC composite. Group D was identical to group C but used VLC dba. Groups C and D utilized metal matrix bands and the autocure composite was allowed to polymerize prior to exposing the VLC composite to the curing light. The specimens were finished using Sof-flex discs (3M), thermocycled, and stained with silver nitrate. The composite restorations were then removed to do a three dimensional evaluation of stain penetration. There was no statistical difference in microleakage among the groups at either the occlusal (enamel) or gingival (dentin/cementum) margins. Occlusal leakage was more limited than gingival leakage, and all specimens but one demonstrated maximal microleakage on a 0-4 scale at the gingival margin. **The authors concluded that the directed shrinkage technique was no more effective at reducing microleakage in posterior composite restorations than incremental placement of VLC composite.**

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The measurement of chlorine activity in biofilm contaminated dental unit water lines. Nemeth JF, Sherman LR, **Mills SE, Plamondon, TJ.** Microchemical Journal 1997;55:134-144.

Twenty-four dental units (A-dec Inc, Newberg, OR) at four institutional dental clinics were equipped with separate water reservoir systems (SWS). Twelve units at three of the clinics had been following the manufacturer recommended protocol to flush the waterlines once per week for 10 minutes with dilute (1:10) bleach for periods ranging from 6 months to 6 years. The other twelve nits had been connected to municipal water and had not been treated with any germicide prior to this study. Four of these units, treated only with sterile deionized water (sdH20), served as controls; four units were treated with a 1:100 dilution of bleach; and four units were treated with a 1:10 dilution of bleach. Baseline measurements of planktonic bacterial counts were made on all units. In the clinics that had been following the manufacturer's protocol, planktonic bacterial counts were typically <100 CFU/mL. Most of the chlorine put into these units was recovered in the first 100 mL flush with sdH20. The units that had not previously been treated exhibited much higher planktonic bacterial counts, ranging from 5.6 X 10^4 to 1.1 X 10^6. The chlorine recovery curve for these units showed a more gradual recovery of the chlorine, indicating that chlorine was probably reacting with the biofilm that was present. There was no measurable chlorine in the last sample of flush water from any units. After four weeks of treatment with 1:10 bleach, the previously untreated units had very low levels of planktonic bacteria (mean: 20 CFU/mL) and had 99.1% chlorine recovery. Untreated controls had higher bacterial counts (mean: 1.3 X 10^4 CFU/mL). Linear regression analysis of per cent chlorine recovered versus log CFU/mL for all units revealed an inverse linear relationship between chlorine recovery and the log of planktonic bacterial counts on SPC Samplers (R^2 **=** 0.26) with an intercept near 96% chlorine recovery. **After four weeks of**

following the manufacturer's protocol (1:10 dilution of 5.25% bleach for 10 minutes each week), in previously untreated dental units, it was possible to reduce planktonic bacterial counts from a range of 10^4 to 10^6 CFU/mL to a range of 0 to 80 CFU/mL. Per cent chlorine recovered from the units increased as the bacterial counts decreased. A measure of the chlorine content in dental unit effluent water may yield a method for determining the presence of biofilm in DUWL.

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GENERAL DENTISTRY

51-06 Silamat S5 Triturator (Project 96-38)

The Silamat S5 triturator is a single-frequency triturator that features touchpad controls, digital liquid crystal display (LCD) for the time setting, and a memory feature that retains the last mixing time setting. The single mixing speed is relatively high at 4500 cycles per minutes (cpm). The unit's mixing arm (fork) is horizontally mounted and operates in an enclosed mixing chamber. While not slotted, each of the two wings has a circular opening to accommodate straight-nozzle glass-ionomer capsules. Mixing time can be set in increments of 1 second up to a maximum of 30 seconds. The time setting remains in the triturator's memory even when the unit is turned off. During mixing, the triturator's LCD display counts down the amount of time remaining. When finished mixing, the unit sounds one, short, audible beep. The S5 automatically shuts off if the cover of the mixing chamber is opened; an audible tone of 3 short beeps is also sounded. The triturator housing is white plastic; the unit weighs 7.5 pounds and is 9 inches wide by 8.75 inches deep by 4 inches high. The triturator is available in the following voltage/frequency configurations: 110-120V/50Hz, 110-120V/60Hz, 220-230V/50Hz, and 220-230V/60Hz.

Manufacturer:
Ivoclar North America, Inc.
175 Pineview Drive
Amherst, NY 14228
(800) 533-6825
(716) 691-0010
(716) 691-2285 FAX

Suggested Retail Price: $569.00

Government Price: $300.00

ADVANTAGES:
+ Mixing frequency is accurate; varies only slightly (by 1 percent) from the manufacturer's stated frequency.
+ Mixing time settings are extremely accurate.
+ Mixing time setting is retained by the triturator's memory even when the unit is turned off.

+ Has safety feature that prevents unit from mixing if the hood covering the mixing chamber is open.
+ Evaluators were impressed by the unit's sleek, simple design which facilitated barrier protection, cleaning, and disinfection.
+ Evaluators felt it was quieter than other triturators they had used.
+ Exhibits minimal vibration during operation.
+ Mixing arm retains capsules securely during operation.
+ Mixing fork accommodates glass-ionomer capsules.
+ A digital display shows mixing time and counts down time as the triturator operates.
+ Is competitively priced (i.e., Silamat S5: $300.00, Vari-Mix III: $354.25, Automix: $441.45).
+ Is supplied with a long (8-foot) cord.
+ Has a three-year warranty.
+ UL listed.

DISADVANTAGES:
- Triturator is a single-frequency unit; mixing frequency can not be changed.
- Manufacturer's instructions do not include recommended mixing time settings for popular amalgam alloys.
- Loading capsules into the mixing arm requires a two-handed technique.
- Some terminology in the product instructions is unusual and confusing.
- Metal clip on mixing fork for holding syringeable, mixed materials is superfluous and limits access when loading the mixing fork.

SUMMARY AND CONCLUSIONS:
The Silamat S5 triturator accommodates amalgam and glass-ionomer capsules and its mixing frequency and times are very accurate. The manufacturer's instructions describe basic product use well. Unfortunately, Ivoclar does not provide recommended mixing times for specific brands of amalgam. It is assumed that at least initially, few amalgam manufacturers will provide recommended mixing time settings for their products when using the S5 triturator. Because this unit is a single, relatively high-frequency unit, Ivoclar should include mixing time recommendations for currently-popular amalgam alloys. Users should be aware that mixing times will need to be reduced when triturating admixed alloys because their working time is shortened when they are mixed at high frequencies. The mixing arm requires a two-handed loading technique. Users judged the triturator to be quiet and were impressed by the unit's sleek, simple design which made barrier protection easy. The unit is competitively priced. The **Silamat S5 triturator** is rated **Acceptable** for use by the federal dental services.

(Lt Col Charlton)

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51-07 Nupro Gold Total Tooth Whitening System (Project 96-64)

The Nupro Total Tooth Whitening System is a clear, syringe-based, 10 percent carbamide peroxide home bleaching product. Dentsply/Ash recommends the gel for treating extrinsically stained teeth, especially those that have a yellow, orange, or light brown color. The treatment process with Nupro Gold is similar to that of other home bleaching products. The clinician makes an alginate impression, and the laboratory pours a cast and fabricates a thin tray. The bleaching agent is then provided to the patient with application instructions. Dentsply/Ash claims that the gel's high viscosity and adhesiveness enhance its effectiveness by helping to retain it in the tray. The tray material in the kit has a textured side that is purported to provide a larger surface area for gel application to the teeth. The gel is mint flavored for better patient acceptance. Nupro Gold is available in three kits: the Deluxe Kit, Standard

Kit, and Touch-Up Kit. The Deluxe Kit contains 10 3-mL syringes of the gel, 2 sheets of tray material, 2 packets of Jeltrate Plus alginate, 2 packets of Labstone dental stone, 1 tube of Triad visible-light-activated resin, 1 tube of 2.0 percent sodium fluoride gel, tray case, patient's instructions, doctor's instructions, and a paper shade guide. The Triad resin is applied to the cast to produce a reservoir area in the tray for the gel. The smaller Standard Kit is essentially the Deluxe Kit without the alginate, stone, Triad resin, and fluoride. The Touch-Up Kit contains 5 3-mL syringes of gel and patient instructions. This project evaluated the Standard Kit.

Manufacturer:

Dentsply/Ash
Dentsply International
570 West College Avenue
York, PA 17405-0872
(800) 877-0020 Ext. 180
(717) 845-7511
(717) 843-5951 FAX

Suggested Retail Price:

$198.00 Standard Kit (item number 614017) case of four kits; each kit contains:
-10 3-mL syringes of tooth whitener
-1 tray storage case
-1 shade guide
-patient's instructions
-doctor's instructions

Government Price:

$119.50 Standard Kit (item number and contents as listed above)

ADVANTAGES:

+ All 34 patients treated in the evaluation reported being "Very Satisfied" or "Satisfied" with their results.
+ Clinical evaluators were impressed with the speed with which product produced results.
+ Expiration date and lot number are printed on box.
+ Product's pH is high enough to prevent it from demineralizing enamel during treatment.
+ Gel's high viscosity and stickiness help retain it in the tray.
+ Syringes contain a generous amount of bleaching gel.
+ Tray material has appropriate thickness and durability.

DISADVANTAGES:

- Product's high viscosity, stickiness, and blunt-end dispensing syringes make it difficult to place the gel into the tray in discrete amounts.
- Package design does not securely hold product.
- Paper shade guide was of limited usefulness.
- Patient instruction card is confusing in its design and refers to use of fluoride gel not provided in the Standard Kit.
- Tray material is flexible and, therefore, more time consuming to trim during fabrication.
- Not provided with a Material Safety Data Sheet (MSDS).

SUMMARY AND CONCLUSIONS:

Nupro Gold was well received by patients who expressed a high degree of satisfaction with the product. Most were pleased with the gel's flavor and ease of use. The results in tooth lightening satisfied all of the 34 patients treated during the evaluation. The gel's increased viscosity and tackiness facilitated its retention in the tray, which should effectively extend its duration of activity. Clinicians commented positively about the speed with which Nupro produced tooth lightening. One disadvantage of the gel's

thickness was that it made it somewhat difficult to place into the tray, especially when localized amounts were placed. Although the gel is slightly more acidic than Dentsply/Ash claims, its pH (6.0) is high enough that it should not cause enamel to demineralize. Patients reported some side effects such as tooth sensitivity, gingival irritation, and nausea. These side effects are common to most bleaching products and did not appear particularly severe or frequent with Nupro. The tray material supplied with Nupro has an appropriate thickness: it is thick enough to provide durability but thin enough to prevent occlusal and joint problems. Although the expiration date is stamped on the box, it would be more helpful to have it stamped on each individual syringe of the gel. The kit's packaging leaves something to be desired. The box has a top that slips over the bottom (which is where the product is located). If the box is gripped from the sides, the contents fall to the floor. In summary, the product was well-received, easy-to-use, and produced excellent results in a relatively short period of time. **Nupro Gold Total Tooth Whitening System** is rated **Acceptable** for use by the federal dental services.

(Lt Col Charlton)

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51-08 Synopsis of Flowable Composite Resins (Project 96-69)

Composite resins have become one of the most commonly used restorative materials in clinical dentistry. Since their introduction over 30 years ago, they have undergone considerable compositional change. This fine tuning has resulted in an overall improvement in their handling characteristics, physical properties, and esthetics. In some clinical situations, however, the relatively high viscosity of many brands of composite makes them difficult to handle and place. Restoring class V lesions, for example, can be particularly frustrating with some composite resins because of their thickness and tackiness. Because of the increasing demand by patients for esthetic, directly-placed, resin restorations, manufacturers sensed a need for esthetic, lower-viscosity composite resins that can quickly and easily be placed. "Flowable" composite resins have been marketed to meet this perceived need. Their percentage filler content by weight (50% to 70%) is less than that of traditional hybrid composite resins (70% to 80%) which gives them a lower viscosity and, their manufacturers contend, excellent handling characteristics. A growing number of these products have been introduced in the last year and although they have certain similarities, enough differences exist to make distinguishing among them difficult. Because of this confusion, supply personnel often find it a challenge to gather basic compositional, packaging, and price information for flowable composites. In order to make this process less trying and time-consuming, DIS has compiled a series of synopsis tables (Attachment 1) presenting this information for eight flowable composite resins. It is important to note that the information in the tables was supplied by the products' manufacturers.

As mentioned earlier, certain similarities exist for the flowable composites. First, they generally are hybrid composite resins and have an average filler particle size of approximately 1 micron. The majority are packaged in syringe form and offer a wide variety of shades indexed to the Vita shade guide. Finally, according to their manufacturers, all are radiopaque and light activated.

As with many new products, there is a need for more information on flowable composites. In particular, information about their physical properties, such as strength, color stability, and wear resistance, is lacking. Unfortunately, few studies have been published that provide information on these properties. It is critical that researchers and clinicians learn this information because a composite resin's properties have an important influence on its clinical performance. Clinical studies are also needed. As indicated by the tables, recommended uses for flowable composites differ from brand to brand. It is important to perform well-controlled clinical studies to ensure that these products can be successfully used for the purposes for which their manufacturers recommend them.

(Lt Col Charlton)

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51-09 Super-Snap® Rainbow Technique Kit (Project 97-12)

The Super-Snap® Rainbow Technique Kit is a new, revised version of Shofu's popular Super-Snap® composite finishing and polishing kit. Several changes were made to the original kit to produce the new Rainbow Kit. Initially, five different grits of disks were provided in a round, ceramic dish. The new kit has only four different grits: Coarse for contouring, Medium for finishing, Fine for polishing, Superfine for super polishing. The disks are arranged and packaged in a semicircular, plastic tray. Two different types of interproximal finishing/polishing strips are also provided: one strip has a coarse-grit end and a medium-grit end while the other has a fine-grit end and a superfine-grit end. Shofu states that the mandrel has been redesigned to more securely hold the disks during use. The disks in the new kit have the same metal-free centers as the old disks which, along with a covered mandrel shaft, are said to prevent inadvertent nicking and discoloration to the polished restoration. The kit contains: a minimum of 20 each of four color-coded disks and mini-disks for finishing and polishing; two mandrels for holding the disks; 40 interproximal polishing strips (Polystrips™); two Dura-White® Stones for finishing and one CompoSite Fine Midi-point for polishing.

Manufacturer:
Shofu Dental Corporation
4025 Bohannon Drive
Menlo Park, CA 94025
(800) 827-4638
(415) 324-0085
(415) 323-3180 FAX

Suggested Retail Price:
$68.95 Super-Snap® Rainbow Technique Kit (item PN 0500), contains:

- -20 Black (Coarse) disks (safe side down)
- -20 Black (Coarse) mini-disks (safe side down)
- -20 Violet (Medium) disks (safe side down)
- -20 Violet (Medium) disks (safe side up)
- -20 Violet (Medium) mini-disks (safe side down)
- -20 Green (Fine) disks (double sided)
- -20 Green (Fine) mini-disks (safe side down)
- -20 Red (Superfine) disks (double sided)
- -20 Red (Superfine) mini-disks (safe side down)
- -2 mandrels
- -20 Black/Violet (Coarse/Medium) interproximal strips (Polystrips™)
- -20 Green/Red (Fine/Superfine) interproximal strips (Polystrips™)
- -2 Dura-White® Stones
- -1 CompoSite Fine Midi-point

Government Price:
$44.82 Super-Snap® Rainbow Technique Kit (order number and contents as listed above)

ADVANTAGES:
+ Research by outside investigators indicates that the product produces a smooth, clinically-acceptable surface on microfill and hybrid composite resins.

+ All evaluators were satisfied with the surface finish produced using the product.
+ Metal-less finishing disc and covered mandrel prevent marring of the restoration's surface during finishing.
+ The four grits of disks and strips are color coded which makes them easier to identify.
+ Disks are easy to place on and remove from mandrel.
+ Mandrel securely retains disks.
+ Each interproximal strip has a two different grits; this reduces waste.
+ Manufacturer's instructions are easy to understand, sufficiently detailed, and provide a good description of product use.

DISADVANTAGES:
- Because only certain disks are double-sided, access to lingual and interproximal surfaces is limited.
- Provided with only two mandrels.

SUMMARY AND CONCLUSIONS:
The Super-Snap® Rainbow Technique Kit is a convenient, user-friendly, well-organized product for finishing and polishing composite resin restorations. The manufacturer's instructions are easy to understand, sufficiently detailed, and provide a good description of product use. Evaluators were impressed with the fact that the disks lacked a central metal hub; this prevented the restoration from being marred during polishing. The mandrel shaft is also covered to prevent marring, but evaluators did not feel this contributed as much to damage-free polishing. The disks and strips are color-coded by grit which makes it easier to identify them. Accompanying finishing and polishing stones work efficiently and help provide access to difficult-to-reach areas. The major shortcoming of the product was the fact that only certain disks are double-sided. None of the small-size disks had abrasive on their undersurface, so access to interproximal and lingual surfaces was compromised. The **Super-Snap® Rainbow Technique Kit** is rated **Acceptable** for use by the federal dental services.

(Lt Col Charlton)

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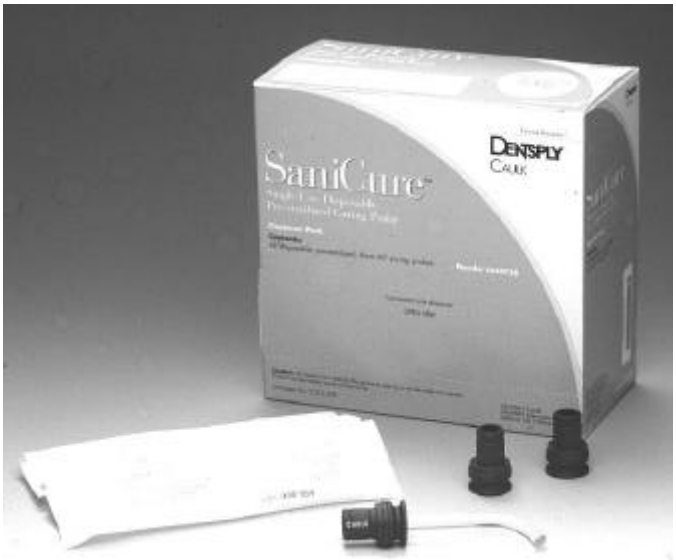
51-10 SaniCure Disposable Curing Probe (Project 97-10)

SaniCure Disposable Curing Probes are pre-sterilized, single-use, individually-wrapped curing wands for use with visible-light curing units. The standard dispenser pack contains 48 curing wands and three adapters for use with Caulk, 3M, and Demetron visible-light curing units. The wands are made of a resin compound molded into a single large fiber. The diameter of the wand at the operative end is 8 mm, while the diameter of the opposite end is 12 mm. This tapered design overcomes any loss of irradiance from the plastic construction as compared to the light transmission of standard glass curing wands. Since the wands are only used once, loss of irradiance transmission due to composite build-up, fiber breakage, chipping, or "boilerplating" can not occur.



Manufacturer:
L.D. Caulk/Dentsply
Lakeview & Clarke Avenues
P.O. Box 359
Milford, DE 19963

(800) 532-2855
(302) 422-4511
(800) 788-4110 FAX

Suggested Retail Price:
$49.95 48 SaniCure Disposable Curing Probes and three adapters.

Government Price:
$28.80 Same as above.

ADVANTAGES:
+ Irradiance is comparable to that of more expensive glass fiberoptic curing wands.
+ Pre-sterilized curing wand is available for each patient.
+ Loss of irradiance due to autoclaving, composite build-up, and fiberoptic chipping and fracture is eliminated.
+ Can be used with three popular visible-light curing units.

DISADVANTAGES:
- More expensive in long term than reusable fiberoptic curing wands.
- Only available in one size and shape.

SUMMARY AND CONCLUSIONS:
The SaniCure Disposable Curing Probe is a viable alternative to conventional glass fiberoptic curing wands. Its one-time use eliminates the concerns of irradiance loss attributed to sterilization, composite build-up, and fiberoptic chipping and breakage. DIS testing found the 8-mm SaniCure wand provided greater irradiance than a standard Demetron 8-mm wand but less than the 8-mm Demetron Turbo-Tip. The SaniCure Disposable Curing Wand utilizes a design similar to the Demetron Turbo-Tip. This design gathers more light from the curing unit's lamp and concentrates it as it exits the curing wand, thus overcoming any potential loss of irradiance from the use of plastic rather than glass fiberoptics. **The SaniCure Disposable Curing Probe** is rated **Acceptable** for use by the federal dental service.

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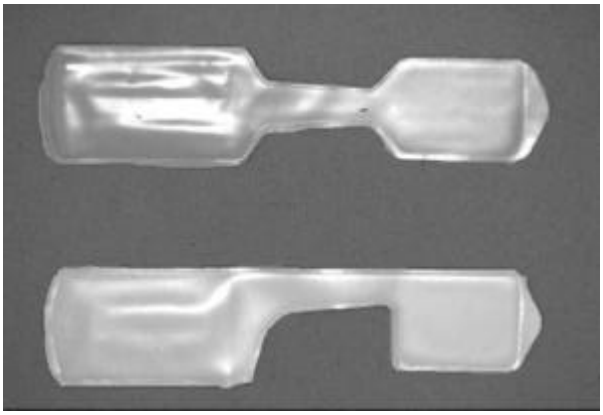
51-11 ECO-30/ERGONOM-X Self Developing Dental Film (Project 96-63)

The ECO-30 and ERGONOM-X are rapid autodeveloping dental films encased in one-piece, green, polyvinyl-chloride (PVC) pouches that do not require a processor or darkroom facilities for developing. The pouches are shaped so that the film is located at one end and the monobath developer/fixer is at the other end. The ends are attached by a slim corridor that conveys the monobath to and away from the film during the developing procedure. The pathway used to transport the monobath to the film is different for the ECO-30 and the ERGONOM-X. The ECO-30's corridor is centered between the middle of the two ends whereas the ERGONOM-X has its corridor located to one side. Following exposure, the film is developed by holding the monobath end of the pouch upright and rolling it down until the liquid chamber ruptures and empties into the corridor. Continuing to roll the pouch ensures that all of the monobath solution travels to the opposite end. The user continues to hold the pouch upright and massages the monobath around in the film end of the pouch for fifty seconds. When development is complete, the pouch is turned upside down and the monobath is massaged back to its original location at the opposite end. The film end of the pouch is then opened by pulling apart the tabs and the film is removed. The film is rinsed under water to remove the remaining monobath solution and the pouch is disposed of in a standard waste receptacle.

Manufacturer:
DENTALFILM srl
Via Leini 96
10036 Settimo Torinese (TO) - Italy

Source:
Kaycom, Incorporated
5800 Thimens Blvd.
St. Laurent, Quebec
H4S 1S5
Canada
(514) 745-5000
(514) 336-5810 FAX



NATO Stock Number 6525-01-440-2017

Suggested Retail Price:
$53.50 Box of 50 ERGONOM-X self developing dental films with instructions.
(Stocklisted item)

Government Price:
$43.50 Same as above.

ADVANTAGES:
+ Operating instructions are detailed and complete.
+ Convenient to use.
+ Provides an adequate image for diagnosis.
+ Easy to dispose, not classified as hazardous waste.
+ Quick processing saves valuable provider time.
+ Adapts easily to established infection control practices.
+ Facilitates rapid diagnosis.
+ Reduces amount of radiographic supplies needed for deployment.
+ No special storage conditions required.

DISADVANTAGES:
- Film size may not be comfortable for all patients.
- Placement with anterior film holders may be difficult.
- Lack of an endodontic dimple (i.e., orientation dot).
- Pouch is rather large.
- Requires longer radiation exposure.
- Protective lead foil to shield film from secondary radiation is absent.

SUMMARY AND CONCLUSIONS:
The ECO-30 and ERGONOM-X are self-developing dental films that evaluators found to be convenient and provide adequate images for oral diagnosis. These products come with comprehensive instructions and are simple to use. They can be developed and fixed chairside in only fifty seconds without the need for additional equipment. Disposal of the used pouch is uncomplicated and does not require hazardous waste collection. Kaycom, Inc. has addressed one disadvantage by adding an endodontic dimple to future orders. Imaging quality is slightly less than that of conventional film, but most users would find images clinically adequate for field conditions. The ECO-30 and ERGONOM-X can be used as a substitute for conventional dental films but require a longer exposure time and are not recommended when normal developing processes are available. Evaluators were impressed with the products potential

as a war readiness item. All clinical evaluators rated the ECO-30 and ERGONOM-X as either "Excellent" or "Good." The **ECO-30** and **ERGONOM-X** are rated **Recommended** for use in field conditions by the federal dental services.

Full report (SSgt Martin, Col Moore) **Return to index**

51-12 Planmeca PM 2002 CC **(Project 97-13)**

The Planmeca PM 2002 CC is a software-controlled, stepper-motor operated dental panoramic x-ray machine. It consists of an x-ray tubehead and a cassette assembly mounted on a support column. Although the unit is designed for imaging patients who are standing, it easily accepts patients seated in wheelchairs. The unit uses three light beams, a chin rest, a bite guide, and a head guide to position and stabilize the patient. Unlike most other stand-up panoramic units, in which the patient faces a mirror, patients enter the PM 2002 CC from the side, facing the technician. This allows the technician to directly observe the patient, which facilitates correct positioning and contributes to distortion-free images. The focal trough is adjustable both for arch size (small, medium, large) and arch shape (narrow, tapered, square). All imaging parameters are easily adjusted using a touchpad mounted on the support column. In TMJ mode, four TMJ exposures can be made on each panoramic film. The small focal spot (0.5 mm by 0.5 mm) produces images with excellent resolution. The unit uses a rigid film cassette and features a unique Autoprint Film Marking System as an available option. The Autoprint keyboard allows the user to enter patient and film exposure information that is imprinted directly and permanently onto the upper edge of panoramic and TMJ films as they are exposed. Another option, the Admark System, allows this information to be added onto cephalometric films in the darkroom. The PM 2002 CC is available in either 110/220 volt, 50/60 cycle alternating current. It requires a ceiling height of 86.5 inches and floorspace measuring 60 inches wide (64 inches with Autoprint option) by 37.5 inches deep.

Manufacturer:
Planmeca OY
Asentajankatu 6,
00810 Helsinki, Finland
358-0-759 05 500
358-0-7599 05 555 FAX

Source:
Planmeca, Inc
362 Balm Court
Wood Dale, IL 60191-1273
(630)-595-7077
(630)-595-7135 FAX

Suggested Retail Price:

$27,000.00	PM 2002 CC (#5001, includes one rigid cassette)
$33,509.00	Standard Panoramic Cephalometric (#50011, includes one panoramic and one cephalometric cassette)
$ 3,130.00	Autoprint option (#50951)
$ 3,995.00	Admark option (#665504)
$ 575.00	Standard Rigid Cassette (#50955, includes set of rare earth screens)
$ 550.00	Cephalometric Cassette (#50959)
$ 725.00	Autoprint Cassette (#665166)

Government Price:

$13,247.35	PM 2002 CC (same as above)
$16,748.00	Standard Panoramic Cephalometric (#50011, includes one panoramic, one cephalometric cassette, and one set of rare earth screens)
$ 1,878.00	Autoprint option (not on Federal Supply Schedule)
$ 2,212.50	Admark option (same as above)
$ 309.75	Standard Rigid Cassette (same as above)
$ 309.75	Cephalometric cassette (same as above)
$ 435.00	Autoprint cassette (not on Federal Supply Schedule)

ADVANTAGES:

+ Produces excellent quality panoramic and TMJ films; small focal spot produces high resolution images.
+ Easy to install and operate.
+ Easy to position patient; provides better than average wheelchair access.
+ Patient faces operator (instead of the wall) during exposure; this may reassure patient and enhance patient confidence.
+ Very effective method for stabilizing patient while film is being made.
+ Operating features rated "Excellent" or "Good" by 100% of field users surveyed.
+ Recommended for use by others by 100% of field users surveyed.
+ Constant potential generator permits use of lower kVp, resulting in lower patient exposure.
+ Has multiple, standard, pre-programmed functions for various arch sizes and shapes and special films (panoramic, enhanced panoramic, TMJ, sinus).
+ Selection of pediatric mode automatically reduces time and field of exposure.
+ Electronic controls allow smooth operation and facilitate changing functions; minimal effort required to switch from panoramic to TMJ to cephalometric.
+ Autoprint option allows automatic labeling of panoramic and TMJ films.
+ Compact tubehead design facilitates patient positioning.
+ Operation manuals available on CD ROM.
+ Less expensive than other units using advanced technology.

DISADVANTAGES:

- More expensive than units based on mechanical technology.
- Company has relatively short track record of government sales.
- Bite forks can not be heat sterilized.

SUMMARY AND CONCLUSION

The Planmeca PM 2002 CC is an electronically-controlled panoramic machine. Its small focal spot, generous focal trough, and smooth movement contribute to its ability to make excellent panoramic, TMJ, and cephalometric images. It is relatively easy to install, easy to use, makes excellent radiographs, and is reliable. Although the PM 2002 CC is more expensive than older, mechanical panoramic units, it is less expensive than other electronically-controlled units. The **Planmeca PM 2002 CC** is rated **Recommended** for use by the Federal dental services.

(Col Plamondon)

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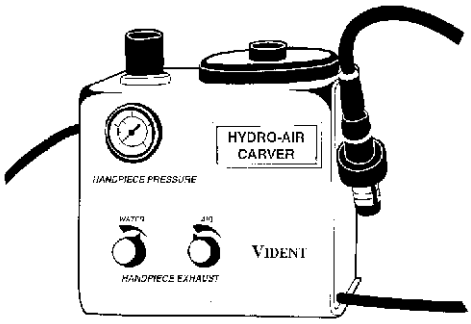
LABORATORY

51-13 Hydro-Air Carver Laboratory Handpiece (Project 96-29)

The Hydro-Air Carver is a high-speed (300,000 rpm) laboratory handpiece with water spray capability. It is designed to prevent the possibility of heat-related damage to porcelain by cooling the restoration with water. The unit is air-driven, eliminating the need for electricity and has a self-contained air regulator and water reservoir. The Hydro-Air Carver comes in a metal case with air and water exhaust knobs on the front of the case. The air regulator knob and water reservoir inlet are located on the top of the case. The water can be adjusted from a very fine spray to a stream. The handpiece, mounted to the right side of the case, weighs 101 grams, is 152 millimeters long, and has a water on/off switch located near the tip. It has an on/off foot switch that does not provide variable speed control. A working air supply of 45 psi is needed to achieve the maximum speed of the handpiece. The unit's dimensions are 210 millimeters high, 254 millimeters wide, 155 millimeters deep, and weighs 3.7 kg. It can be wall mounted or placed on a table-top.

Manufacturer:
Vident
3150 East Birch Street
P.O. Box 2340
Brea, CA 92622-2340
(800) 828-3839
(714) 961-6200
(714) 961-6299 FAX



Suggested Retail Price: $695.00

Government Price: $590.75

ADVANTAGES:
+ Power was comparable to that of a typical operatory high-speed handpiece.
+ Water spray reduces the frictional heat of unit being abraded.
+ Noise level is 74 dB, below maximum level of 85 dB permitted by safety standard.
+ All controls are within easy reach.
+ Minimal maintenance required.
+ Simple and quick installation.

DISADVANTAGES:
- Large footprint takes up too much space on the table top if not mounted on the wall.
- Chuck release mechanism requires one and a quarter turns to release or secure a bur.
- Water level window is located on the back of the unit causing the user to move the unit to check water level

SUMMARY AND CONCLUSIONS:
The Hydro-Air Carver is well built and simple to maintain. The handpiece has internal water spray, is well-balanced and is comfortable to use. The water spray cooled and prevented chipping of porcelain in the laboratory evaluation. Clinical evaluators used the spray five to ten percent of the time and anecdotally reported no perceived advantages to the water spray. During DIS testing, water spray that cooled and lubricated the restoration appeared to be more reliable for preventing microcracks than

relying on sight and touch to prevent overheating during grinding. This handpiece would be most useful for technicians who carve the majority of their occlusal anatomy with a high-speed handpiece. The water spray eliminates the need for repeatedly wetting a restoration by hand while grinding. The effect of the water spray on the dust collector (if used with the water spray) is unknown. Although the evaluation on this single unit showed only 249,000 rpms, compared to the claimed 300,000 rpms, the evaluators felt the unit performed satisfactorily. The peak power (a function of speed and torque) for the handpiece was measured at 12 watts and adequately performed its intended clinical use. The handpiece is sturdy and capable of finishing porcelain and fine-finishing dental alloys. The unit comes assembled and only requires attaching the appropriate fittings to the air supply tube. Hand tools are needed only if mounting the unit on the wall. The **Hydro-Air Carver** is rated **Acceptable** for use by the federal dental services.

Full report

(Msgt Ryerson)

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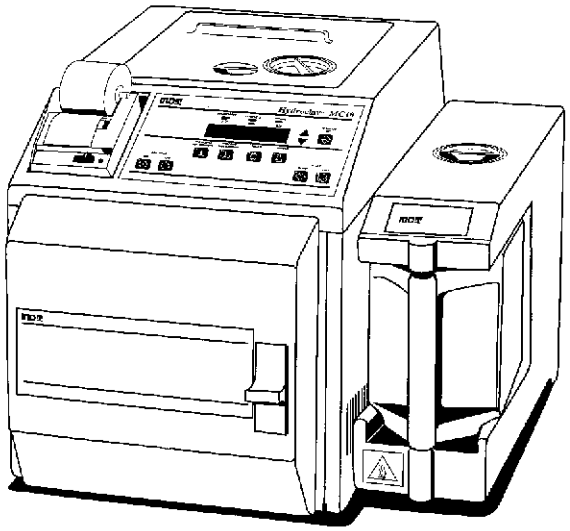
INFECTION CONTROL

51-14 Harvey MC10 Hydroclave **(Project 96-40)**

The Harvey MC10 Hydroclave is a fully-automated, microprocessor-controlled autoclave with a 10-inch diameter by 15½-inch deep, round, stainless steel chamber and a non-recirculating water system. This system utilizes fresh water for each sterilization cycle and the used water is exhausted directly into a sink/drain or into the optional non-recirculating water collection reservoir. The exterior dimensions of the sterilizer are 18 inches high by 16 inches wide (add 7 inches for non-recirculating water collection reservoir) by 25¾ inches deep (non-recirculating water collection reservoir connections included). Government models are equipped with dual voltage selection. The autoclave operates at 115 volts ± 5% or 230 volts ± 5%, 50/60 Hz with a loading of 1.495 kW. The unit can be configured for either plug-in or hard-wired electrical connection and requires a 20 amp circuit breaker. A dedicated electrical circuit is recommended for fault-free operation. The microprocessor-controlled sterilization parameters are constantly monitored to assure proper sterilization for each programmed cycle. A time-temperature interlock assures that the sterilization cycle does not begin until the correct parameters are met. Four icon-marked programs on the sealed membrane pad-switch (e.g., wrapped, unwrapped, paper/plastic pouches or liquids) are available which initiate the entire cycle when selected and depressed. All selections are preset for drying except for the liquids cycle. Upon cycle completion, the unit exhausts, beeps twice, and the “STOP” indicator flashes until the door is opened or the “STOP” button is pressed again (if no drying time was selected). If drying was selected, the display shows “Drying” for the duration of time selected. When the drying time is complete, three groups of three beeps sound and the “COMPLETE” indicator lights. All sterilization parameters (date, time, pressure, and temperature) are displayed digitally and can be recorded with an optional printer. The



digital display indicates function status during operation and error codes for testing and trouble-shooting. The sterilizer is UL and IEC 601-1 listed and is certified by ETL, CSA, ASME and ANSI/ADA.

Manufacturer:
GETINGE/Castle
Formerly MDT Biologic Company
19645 Rancho Way
Rancho Dominguez, CA 90220-6039
(310) 608-2290
(310) 608-7705 FAX

Government Source:
GETINGE/Castle Government Sales
Contact: Ken Sealey
1517 Ritchie Highway
Suite 209
Arnold, MD 21012
(800) 394-4638
(410) 757-8585
(410) 757-1586 FAX

Suggested Retail Price:

Price	Features
$4,695.00	Basic model.
$4,890.00	Includes basic model and non-recirculating water collection reservoir.
$5,295.00	Includes basic model and optional printer.
$5,490.00	Includes basic model, printer, and non-recirculating water collection reservoir.

Government Price:

Price	Features
$2,195.00	Basic model.
$2,295.00	Includes basic model and non-recirculating water collection reservoir.
$2,495.00	Includes basic model and optional printer.
$2,595.00	Includes basic model, printer, and non-recirculating water collection reservoir.
$2,995.00	Includes basic model, printer, non-recirculating water collection reservoir, and dual voltage.

ADVANTAGES:
+ Non-recirculating water system.
+ Less soiling of packs and instruments from handpiece lubricant and water deposits.
+ Easy to fill reservoir.
+ Four cycles available (e.g., liquids, wrapped, unwrapped, and pouches).
+ Microprocessor controlled for accurate cycle management.
+ Lever-type door handle with dual locking pins ensures even door closure.
+ Has resident diagnostics to verify proper functioning of sterilizer.
+ Reservoir can be easily and completely drained for cleaning.
+ Standard off-the-shelf interchangeable parts may speed some repairs.
+ Operating and servicing instructions are clear and easy to understand.
+ User-replaceable chamber and reservoir filters.
+ Chamber wire rack option allows cassette or trays to be processed vertically.
+ Optional printer is available for documenting cycle parameters.
+ One-piece seamless chamber.

+ Ergonomic design of non-recirculating water collection reservoir aids in emptying.

DISADVANTAGES:
- Large footprint when unit is used with non-recirculating water collection reservoir.
- Heating element is not field replaceable.
- Printer must be changed when changing voltage.
- Requires tools for door gasket replacement.
- Non-reversible door gasket.
- Reservoir filling may be limited by certain overhead cabinet designs.
- Sectional construction for exterior covers makes interior servicing cumbersome.
- Wrapping to hold insulation in place uses 23 “Ace Bandage” type clips and must be cut for access to heating elements for repairs and replacement.
- Top cover (reservoir) must be in place for testing during maintenance.
- No power on/off switch.

SUMMARY AND CONCLUSIONS:
The Harvey® MC10 Hydroclave has an innovative design for its non-recirculating water system to minimize instrument contamination from accumulated handpiece lubricant and water deposits. The life of the sterilizer should be extended because contaminated water does not recirculate in it. The sterilizer has four pre-programmed cycles (i.e., liquids, flash, wrapped, and pouches). Its microprocessor-controlled operation allows for accurate cycle management while providing diagnostics. The use of a time-temperature interlock prevents the final sterilization cycle from beginning until the proper temperature/pressure is reached. Door gasket replacement, chamber filter cleaning, and reservoir cleaning can be accomplished with a minimum of effort using standard hand tools. Documentation is well organized with graphics to assist in servicing and operation. The sterilizer can accommodate two standard (8½x11½x1½) and two small dental (4½x8½x1½) instrument cassettes placed horizontally with its standard tray-rack system. An optional cassette rack can accommodate 4 standard and 2 small vertically-placed cassettes. With efficiency being a product of cycle speed and drying time, the MC10 Hydroclave is comparable to other tabletop sterilizers. This sterilizer is an appropriate choice for clinics of all sizes, however its large overall footprint takes up valuable counter space. The user-friendly appearance and controls make it easy to use while being informative during all phases of operation. The sterilizer proved to be very reliable throughout the evaluation period and was rated as “Excellent” or “Average” by the clinical evaluators. The **Harvey® MC10 Hydroclave** sterilizer is rated **Acceptable** for use by the federal dental services.

Full Report

(Mr Gambal, Lt Col Leonard)

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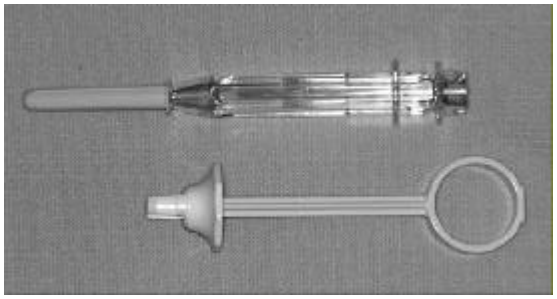
51-15 UltraSafe Safety Syringe **(Project 96-44)**

The UltraSafe Safety Syringe, manufactured by Safety Syringes, Incorporated, is a disposable dental aspirating syringe designed to prevent percutaneous injuries by eliminating needle handling and recapping. The syringe has two disposable components which come packaged in a sterile plastic pouch: the body assembly and the plunger unit. The body assembly is constructed of translucent, resilient plastic and a flexible metal hypodermic needle. It features an inner plastic barrel into which a glass anesthetic carpule is inserted and an outer sheath that is used to guard the needle by sliding it forward when injection is complete. The needle is molded into the plastic body during manufacture and provides a stable attachment point. There are three bevels at the injection tip of the needle and a single bevel at the distal end for carpule membrane penetration. The plunger unit, consisting of the plunger and endcap of the syringe, is



molded from opaque, high-density polycarbonate. The plunger features a thumb ring at one end to facilitate aspiration and a multi-pronged harpoon at the other end to engage the anesthetic carpule stopper. The shaft of the plunger is a rounded cross shape and slides along a limited track in the endcap. The octagonal-shaped endcap has a built-in finger grip and two protrusions that lock into the body assembly.

When the two components are removed from the sterile plastic pouch, there is a plastic cap over the needle and the protective sheath is retracted along the length of the barrel. The anesthetic carpule is inserted into the open end of the body assembly. This facilitates the puncturing of the carpule membrane by the distal end of the needle. The plunger unit is then inserted, aligning the endcap legs to the corresponding body notches, and pushed firmly until snapped in place. The assembled syringe is grasped between the collar of the body assembly and the octagonal endcap to facilitate engagement of the harpoon. The harpoon is engaged in a conventional manner, with a firm blow from the palm of the hand to the thumb ring of the plunger. Aspiration and injection follow standard dental procedures.

Manufacturer:
Safety Syringes, Incorporated
250 West Colorado Boulevard, Suite 101
Arcadia, CA 91007
(800) 508-6464
(818) 821-1121
(818) 821-1009 FAX

Suggested Retail Price:
$11.80 Box of 20 disposable UltraSafe Safety Syringes with instructions.

Government Price:
$10.80 Same as above.

ADVANTAGES:
+ Provides an engineering control that makes incorrect needle recapping less likely.
+ Should be more effective in preventing percutaneous injuries than a conventional dental aspirating syringe and needle.
+ Provides a sterile syringe when used with an aseptic technique.
+ Allows users to reload for multiple injections.
+ Easy to see aspirated blood through translucent body assembly.
+ Is disposable and lightweight.
+ May be convenient for field use.

DISADVANTAGES:
- Difficult to reload when more than one carpule of anesthetic is desired.
- Plunger does not function as smoothly as a conventional aspirating syringe.
- Produces increased volume of sharps waste.
- More expensive than using a conventional syringe system.
- Users noted a marked decrease in needle sharpness if used for multiple injections.
- Syringe may not be suitable for intraligmental injections.

SUMMARY AND CONCLUSIONS:
The UltraSafe Safety Syringe is a disposable aspirating syringe that evaluators found was comfortable and provided good access to all areas of the oral cavity. The product comes with complete instructions and is fairly simple to assemble. It delivers anesthesia using standard dental carpules and utilizes a needle guard to make percutaneous injuries less likely. The UltraSafe Safety Syringe can be used as a substitute for a conventional dental syringe and needle but has several limitations that led 66 percent

(4/6) of the evaluators to rate it as “Fair.” Shortcomings mentioned by the clinical users included poor short-term needle sharpness, noticeable stickiness when operating the non-lubricated plunger, and an increase in sharps waste. Users also found it difficult to load carpules when they were needed for additional injections and felt the product was unsuitable for intraligmental injections. In comparison with other disposable syringes, the **UltraSafe Safety Syringe** is rated **Acceptable** for use by the federal dental services.

Full Report

(SSgt Martin)

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APPEARING IN FUTURE ISSUES OF *DENTAL ITEMS OF SIGNIFICANCE*--

Reviews of:

Plus more Questions & Answers, Product Reviews from the Literature, and New Dental Products.

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SYNOPSIS OF FLOWABLE COMPOSITE RESINS (Table 1)*

Product	Manufacturer	Recommended Uses	Contents of Kit	Shades Available	Composite Type	Matrix
Æliteflo	Bisco Dental Products 1500 West Thorndale Ave Itasca, IL 60143 (800) 247-3368 (800) 247-3368 (800) 247-3368	class IIIs, Vs, and small class IVs; small core build-ups; cementing porcelain veneers and temporaries; repairing margins; splinting; tunnel preps; class I and II liner	five 1.5-gm syringes each of shades A1, A2, A3.5, C2, and D3; 50 disposable, angled, 20-gauge needle tips; instructions and Material Safety Data Sheet	A1, A2, A2-O, A3, A3.5, A5, B3, C2, C3, D3, opaque-white, and trans-incisal	hybrid	Bis-GMA and proprietary elastic long-chain monomer
Fl Restore	Den-Mat Corporation P.O. Box 1729 Santa Maria, CA 93456 (800) 433-6628 (805)922-8491 (805) 922-6933 FAX	small class IIIs, Vs, and VIs with difficult access; repairing margins, pit and fissue sealing; blocking out undercuts; tunnel preps	nine 1-gm syringes each of shades A2, A3, A3.5, B1, B2, B3, C2, C3, and opaque; syringe tips	A2, A3, A3.5, B1, B2, B3, C2, C3, opaque	submicron hybrid	Bis-GMA
Flow-It	Jeneric/Pentron, Inc. 53 N Industrial Plains Rd Wallingford, CT 06492 (800) 243-3100 (203)265-7397 (203) 284-3310 FAX	class Vs, small class Is, IIIs, and IVs; direct resin veneering; repairing porcelain and marginal defects; small core build-ups	four 1-mL syringes each of shades A2, B2, C3, and universal opaque; ten 22-gauge bent needle tips; instructions	A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4, clear, universal opaque, gingival light,	microfil	Bis-GMA

				dark		
Revolution	E&D Dental Products71 Veronica Avenue STE 3 Somerset, NJ 08873 (800)526-4911 (908) 249-6000 (908) 249-3535 FAX	class IIIs and Vs; select-ed class IVs; pit and fissure sealing; repairing porcelain; cementing veneers; core build-ups	four 1-gm syringes in any of the 15 available shades; 20 metal/plastic dispensing tips	A1, A2, A3, A3.5, A4, B2, B3, C2, C3, C4, C1/D1, light incisal, white opaque, opaque, gingival pink	hybrid	Bis-GMA
UltraSeal XT Plus	Ultradent Products, Inc. 505 West 10200 SouthSouth Jordan UT 84095 (800) 552-5512 (801) 572-4200 (801) 572-0600 FAX	pit and fissure sealing; initial layer of composite restorations; micro-retentive restorations	one 1.2-cc syringe of Ultraseal XT Plus; one 1.2-cc syringe of 35% H3PO4 etchant; two 1.2-cc syringes of PrimaDry (a drying and priming agent); 12 Micro Tips; 10 Mini Tips	opaque white, tinted translucent, A2 (universal)	hybrid	Bis-GMA

Product	Manufacturer	Recommended Uses	Contents of Kit	Shades Available	Composite Type	Matrix
Star Flow	Danville Engineering 2021 Omega Road San Ramon, CA 94583 (800) 827-7940 (510) 838-7940 (510) 838-0944 FAX	class I - V (class II low abrasion applications); cavity lining; core build-ups; repairing dentures, porcelain, crown margins, and temporaries; pit and fissure sealing; tunnel preps	one 5-gm syringe each of shades A2, A3.5, and incisal; 100 20-gauge disposable syringe tips	A1, A2, A3, A3.5, A4, A5, B2, C2, C4, incisal, dentin	hybrid	Bis-GMA
VersaFlo	Centrix, Inc. 770 River RoadShelton, CT 06484 (800) 235-5862	class IIIs, IVs, and Vs; small class IIs; conser-vative class Is; repairing porcelain and dentures; bonding	four single-dose, Needle-Tube tips each of shades A2, A3, B3, and C3	A1, A2, A3, A3.5, A4, B3, C3, and opaque	hybrid	Bis-GMA

	(203) 380-5944 (203) 380-5933 FAX	fibrous splints; pit and fissure sealing; cementing veneers; restoring incisal abrasion; recontouring temporaries; sealing implant heads; sealing margins; conservative tunnel preps; gingival floor of class II restorations	(Starter Kit #1), or shades A1, A3.5, A4, and opaque (Starter Kit #2); Mark II placement syringe			
Tetric Flow	Ivoclar North America 175 Pineview Drive Amherst, NY 14228 (800) 533-6825 (716) 691-0010 (716) 691-2285 FAX	class IIIs, IVs, and Vs; small posterior restorations; pit and fissure sealing; repairing composite and ceramic veneers; blocking out undercuts; cementing composite and ceramic restorations; splinting mobile teeth; cementing Vivadent's Sonicsys inlays	five 0.25-gm cartridges each of shades 105 (no equivalent Vita shade), A1, A2, A3, A3.5, A4, B3, T (translucent); shade guide, accessories	105 (no equivalent Vita shade), A1, A2, A3, A3.5, A4, B3, and T (translucent)	ceromer	Bis-GMA and UDMA

*Data in this table was provided by the manufacturers.

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SYNOPSIS OF FLOWABLE COMPOSITE RESINS (Table 2)*

Product	FILLER PARTICLE AND AVERAGE SIZE	PERCENTAGE FILLER (WT/VOL)	Shrinkage (% VOL)	METHOD OF ACTIVATION	Radiopaque	Contains FLUORIDE	Retail/ GOV'T PRICES
Æliteflo	barium, colloidal silica 0.7 micron	60/NA**	4	light activated	yes	no	$60.00/ $30.00
Fl Restore	silica, barium glass, barium fluorosilicate 0.7 micron	50/43	1.5	light activated	yes	yes	$59.00/ $47.20
Flow-It	barium borosilicate 1.5 microns	70.5/NA**	3	light activated	yes	yes	$29.95/ $26.96
Revolution	barium glass and synthetic silica approx. 1 micron	62/46	NA**	light activated	yes	yes	$37.95/ $24.67
UltraSeal XT Plus	glass ionomer 1 to 1.5 microns	60/NA**	NA**	light activated	yes	yes	$43.75/ $37.19
Star Flow	barium glass 0.7 micron	61/41	1.2	light activated	yes	yes	$129.95/ $116.96
VersaFlo	barium glass NA	NA**/72	NA**	light activated	yes	yes	$88.20/ $74.95
Tetric Flow	barium glass (43.5% wt), ytterbium tri-fluoride (14.6% wt), mixed oxide (4.4% wt), barium alumin-um fluorosilicate glass (4.4%	68/44	NA**	light activated	yes	yes	$119.00/ $65.45

wt), highly dispersed silica (0.9% wt) 0.7 micron

- Data in this table was provided by the manufacturers.
- * NA (not available) indicates the information was not provided by the manufacturer.

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